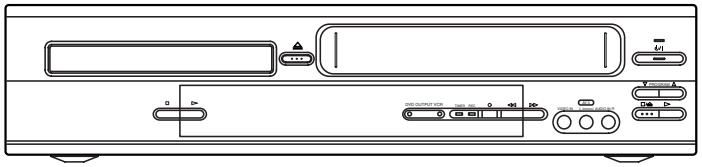
# HITACHI

**No. 9305**

**DVPF3E**
**DVPF3EUK**

# SERVICE MANUAL



SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

## DVD PLAYER & VIDEO CASSETTE RECORDER

May 2003 Digital Media Division

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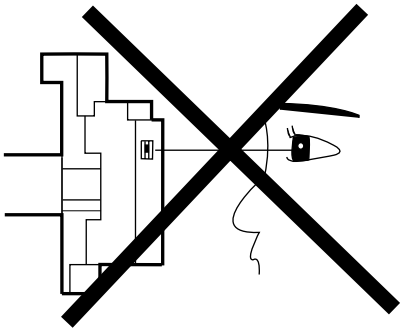
# 1 CAUTIONS FOR SAFETY IN PERFORMING REPAIR

## 1-1 LASER BEAM SAFETY PRECAUTIONS

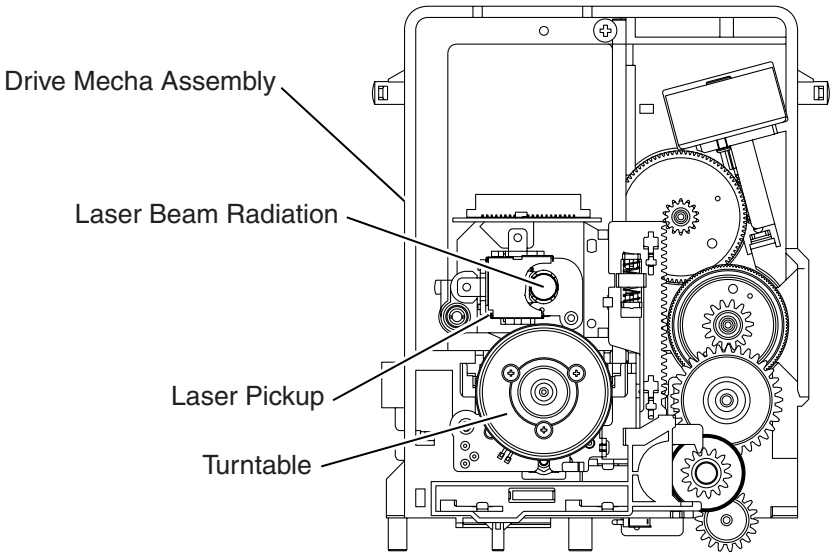
This DVD player uses a pickup that emits a laser beam.



**Do not look directly at the laser beam coming from the pickup or allow it to strike against your skin.**

The laser beam is emitted from the location shown in the figure. When checking the laser diode, be sure to keep your eyes at least 30cm away from the pickup lens when the diode is turned on. Do not look directly at the laser beam.

**Caution:** Use of controls and adjustments, or doing procedures other than those specified herein, may result in hazardous radiation exposure.



# 1-2 IMPORTANT SAFETY PRECAUTIONS

## 1-2-1 Product Safety Notice

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by a ⚠ on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The Product's Safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are carefully inspected to confirm with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

## 1-2-2 Precautions during Servicing

**A.** Parts identified by the ⚠ symbol are critical for safety. Replace only with part number specified.

**B.** In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.

**C.** Use specified internal wiring. Note especially:

1)Wires covered with PVC tubing

2)Double insulated wires

3)High voltage leads

**D.** Use specified insulating materials for hazardous live parts. Note especially:

1)Insulation tape

2)PVC tubing

3)Spacers

4)Insulators for transistors

**E.** When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.

**F.** Observe that the wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).

**G.** Check that replaced wires do not contact sharp edges or pointed parts.

**H.** When a power cord has been replaced, check that 5 - 6 kg of force in any direction will not loosen it.

**I.** Also check areas surrounding repaired locations.

**J.** Be careful that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

**K.** Crimp type wire connector
The power transformer uses crimp type connectors which connect the power cord and the primary side of the transformer. When replacing the transformer, follow these steps carefully and precisely to prevent shock hazards.
Replacement procedure

1)Remove the old connector by cutting the wires at a point close to the connector.
**Important:** Do not re-use a connector. (Discard it.)

2)Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

3)Align the lengths of the wires to be connected. Insert the wires fully into the connector.

4)Use a crimping tool to crimp the metal sleeve at its center. Be sure to crimp fully to the complete closure of the tool.

**L.** When connecting or disconnecting the internal connectors, first, disconnect the AC plug from the AC outlet.

## 1-2-3 Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts, and wires have been returned to their original positions. Afterwards, do the following tests and confirm the specified values to verify compliance with safety standards.

### 1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1-2-1)

**Table 1-2-1 : Ratings for selected area**

| AC Line Voltage | Clearance Distance (d) (d') |
|---|---|
| 230 V | ≥ 3 mm(d)<br>≥ 6 mm(d') |

**Note:** This table is unofficial and for reference only. Be sure to confirm the precise values.

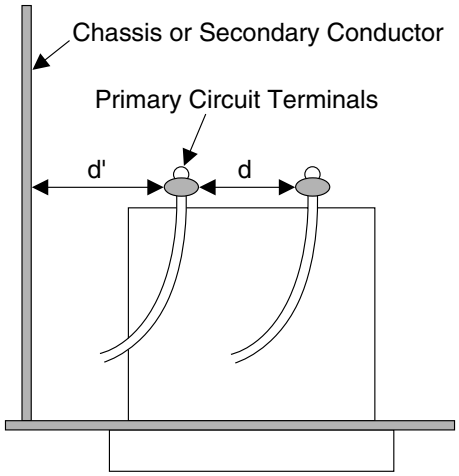



**Fig. 1-2-1**

### 2. Leakage Current Test

Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) is lower than or equal to the specified value in the table below.

**Measuring Method (Power ON) :**

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across the terminals of load Z. See Fig. 1-2-2 and the following table.

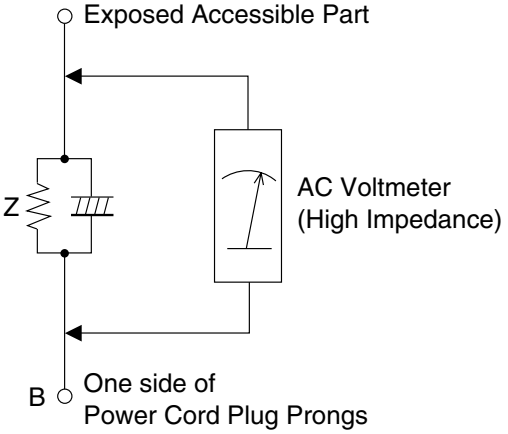



**Fig. 1-2-2**

**Table 1-2-2: Leakage current ratings for selected areas**

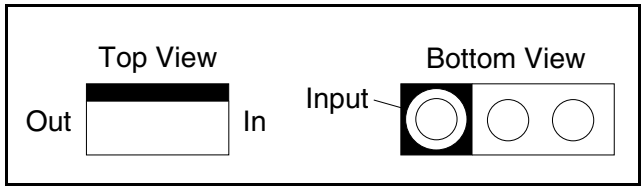
| AC Line Voltage | Load Z | Leakage Current (i) | One side of power cord plug prongs (B) to: |
|---|---|---|---|
| 230 V | 2kΩ RES.<br>Connected in parallel | i≤0.7mA AC Peak<br>i≤2mA DC | RF or<br>Antenna terminals |
| | 50kΩ RES.<br>Connected in parallel | i≤0.7mA AC Peak<br>i≤2mA DC | A/V Input, Output |

**Note:** This table is unofficial and for reference only. Be sure to confirm the precise values.

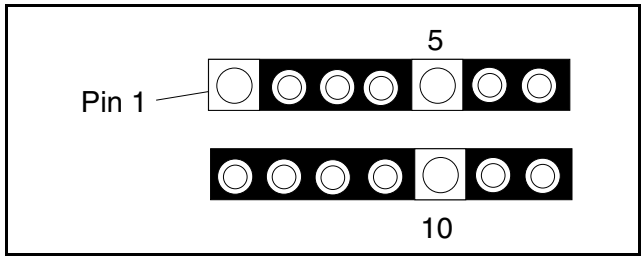
# 1-3 STANDARD NOTES FOR SERVICING

## 1-3-1 Circuit Board Indications

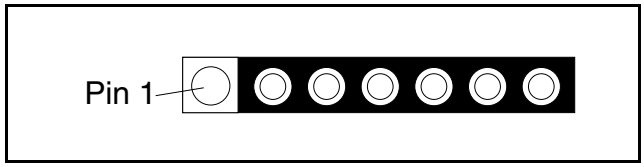
1. The output pin of the 3 pin Regulator ICs is indicated as shown.




2. For other ICs, pin 1 and every fifth pin are indicated as shown.

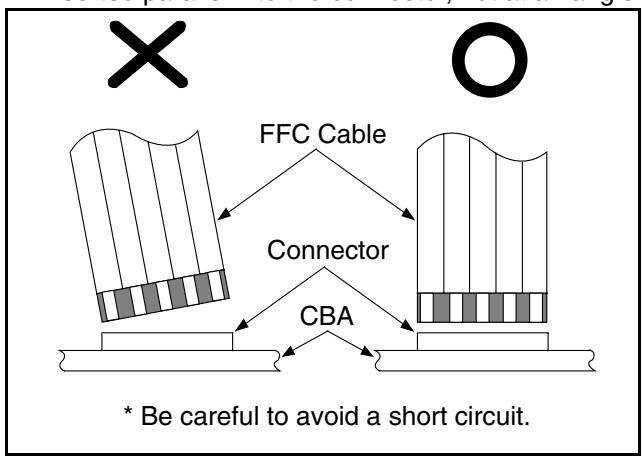



3. The 1st pin of every male connector is indicated as shown.




## 1-3-2 Instructions for Connectors

1. When you connect or disconnect the FFC (Flexible Foil Connector) cable, be sure to first disconnect the AC cord.
2. FFC (Flexible Foil Connector) cable should be inserted parallel into the connector, not at an angle.




## 1-3-3 How to Remove / Install Flat Pack-IC

### 1. Removal

**With Hot-Air Flat Pack-IC Desoldering Machine:**.

(1) Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. 1-3-1)

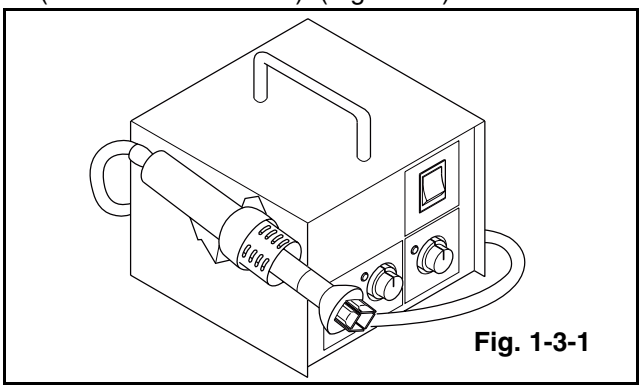


**Fig. 1-3-1**

(2) Remove the flat pack-IC with tweezers while applying the hot air.

(3) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. 1-3-6)

(4) Release the flat pack-IC from the CBA using tweezers. (Fig. 1-3-6)

### Caution:

1. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape around the flat pack-IC to protect other parts from damage. (Fig. 1-3-2)
2. The flat pack-IC on the CBA is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

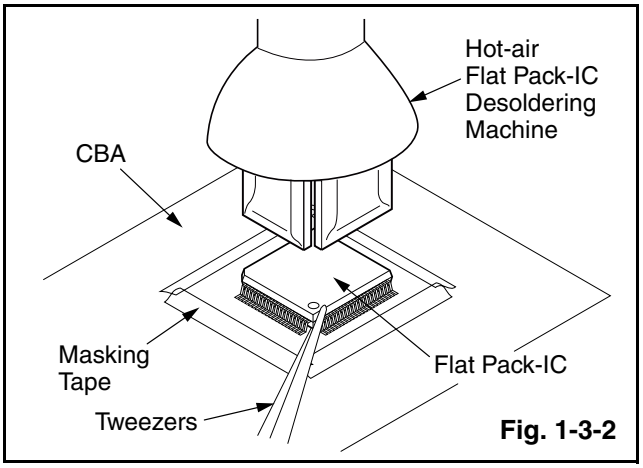



**Fig. 1-3-2**

**With Soldering Iron:**

(1) Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. 1-3-3)

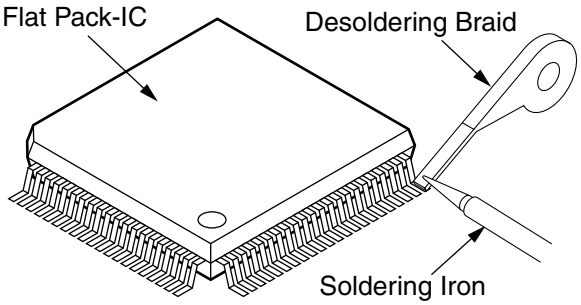



**Fig. 1-3-3**

(2) Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine. (Fig. 1-3-4)

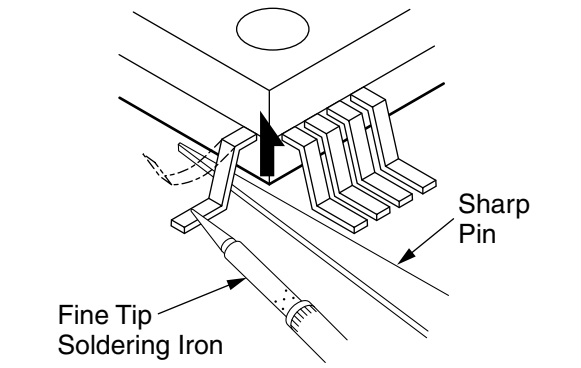



**Fig. 1-3-4**

(3) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. 1-3-6)

(4) Release the flat pack-IC from the CBA using tweezers. (Fig. 1-3-6)

**With Iron Wire:**

(1) Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. 1-3-3)

(2) Affix the wire to a workbench or solid mounting point, as shown in Fig. 1-3-5.

(3) While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the CBA contact pads as shown in Fig. 1-3-5.

(4) Bottom of the flat pack-IC is fixed with glue to the CBA; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. 1-3-6)

(5) Release the flat pack-IC from the CBA using tweezers. (Fig. 1-3-6)

**Note:**

When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the CBA, handle it gently because it may be damaged if force is applied.

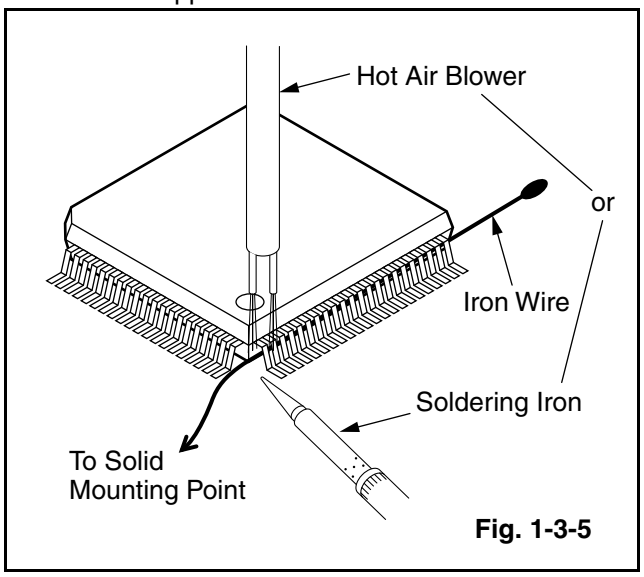



**Fig. 1-3-5**

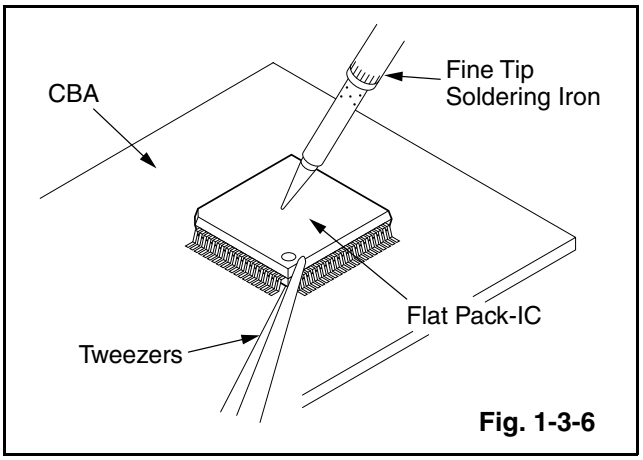



**Fig. 1-3-6**

## 2. Installation

(1) Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the CBA so you can install a replacement flat pack-IC more easily.

(2) The "●" mark on the flat pack-IC indicates pin 1. (See Fig. 1-3-7.) Be sure this mark matches the 1 on the PCB when positioning for installation. Then presolder the four corners of the flat pack-IC. (See Fig. 1-3-8.)

(3) Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.

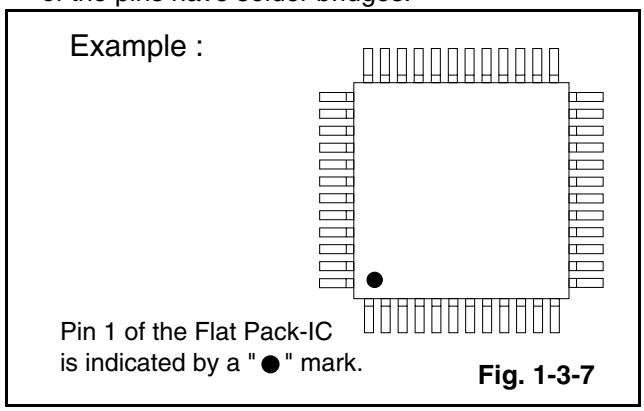



**Fig. 1-3-7**

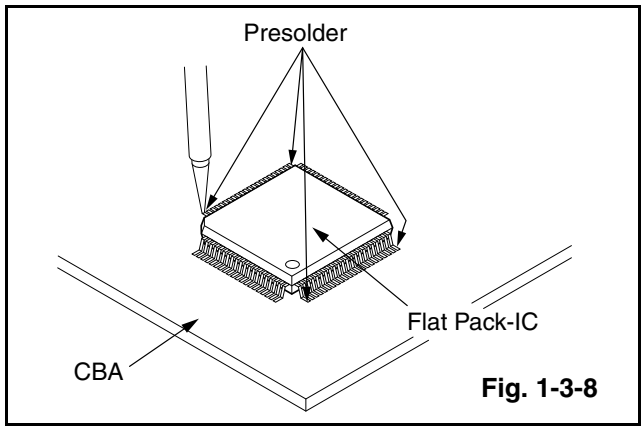



**Fig. 1-3-8**

# 1-3-4 Instructions for Handling Semi-conductors

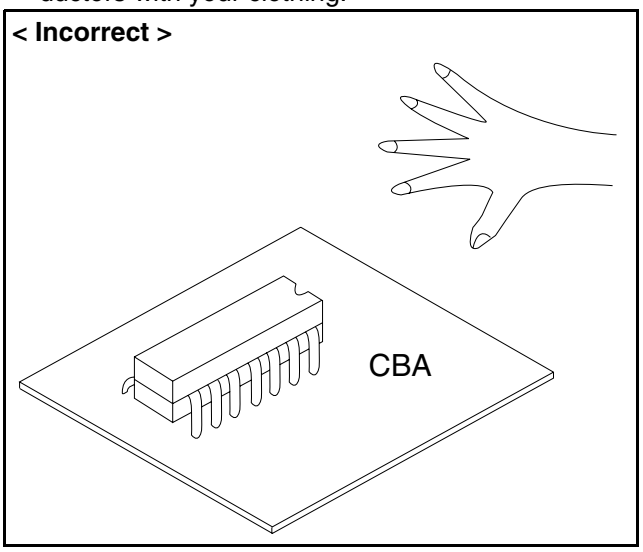
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

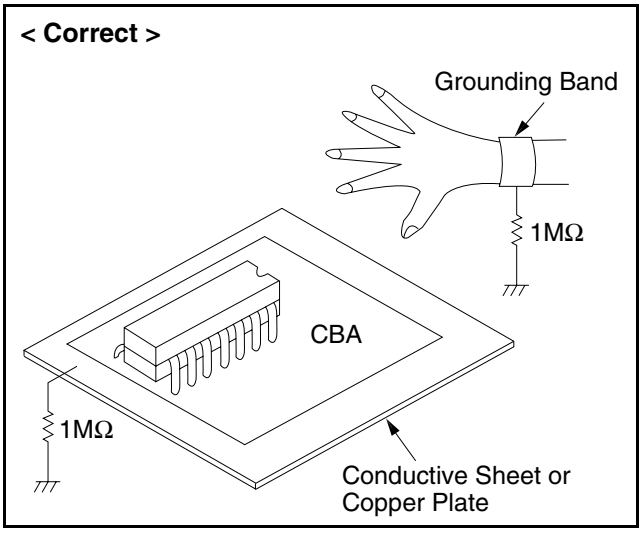
## 1. Ground for Human Body

Be sure to wear a grounding band (1MΩ) that is properly grounded to remove any static electricity that may be charged on the body.

## 2. Ground for Workbench

(1) Be sure to place a conductive sheet or copper plate with proper grounding (1MΩ) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semi-conductors with your clothing.



# 2 GENERAL INFORMATION

## 2-1 SPECIFICATIONS

<table>
<tr><th colspan="2">ITEM</th><th colspan="4">DESCRIPTION</th></tr>
<tr><td rowspan="20">Video section</td><td>TV system</td><td colspan="4">PAL</td></tr>
<tr><td>Video head</td><td colspan="4">Rotating 4 heads</td></tr>
<tr><td>Recording system</td><td colspan="4">Rotating 2 head helical scan brightness signal FM method<br>VHS standard for methods to directly record color signal low frequency conversions</td></tr>
<tr><td>Audio track</td><td colspan="4">Hi-Fi audio track: 2 channel<br>Normal audio track: 1 channel</td></tr>
<tr><td>Tape</td><td colspan="4">VHS-type videocassette</td></tr>
<tr><td>Tape speed</td><td colspan="4">{SP}: 23.39 mm/s {LP}: 11.70 mm/s</td></tr>
<tr><td>Maximum record and playback time</td><td colspan="4">{SP}: 4 hours (with E-240 used)<br>{LP}: 8 hours (with E-240 used)</td></tr>
<tr><td rowspan="9">Receiving channel</td><td colspan="2">DV-PF3E</td><td colspan="2">DV-PF3E(UK)</td></tr>
<tr><td>CH Indication</td><td>TV Channel</td><td>CH Indication</td><td>TV Channel</td></tr>
<tr><td>02-12</td><td>E2-E12</td><td>01-10</td><td>TRA-IRJ, GAP</td></tr>
<tr><td>13-20</td><td>A-H (only ITALY)</td><td>21-69</td><td>E21-E69</td></tr>
<tr><td>21-69</td><td>E21-E69</td><td>74-78</td><td>X.Y.Z.Z+1.Z+2</td></tr>
<tr><td>74-78</td><td>X.Y.Z.Z+1.Z+2</td><td>88-99, 100</td><td>S1-S20, GAP</td></tr>
<tr><td>80-99, 100</td><td>S1-S20, GAP</td><td>121-141</td><td>S21-S41</td></tr>
<tr><td>121-141</td><td>S21-S41</td><td></td><td></td></tr>
<tr><td>Reception system</td><td colspan="4">Up-heterodyne</td></tr>
<tr><td>RF converter</td><td colspan="4">RF CONVERTER</td></tr>
<tr><td>Converter output</td><td colspan="4">UHF 22 - 69 ch [G: 36 ch (DV-PF3E), I: 35 ch (DV-PF3E(UK))]</td></tr>
<tr><td>Timer display</td><td colspan="4">24-hour system</td></tr>
<tr><td>Video output impedance</td><td colspan="4">75 Ω</td></tr>
<tr><td>Video output level</td><td colspan="4">1.0 V P-P</td></tr>
<tr><td>Audio output level</td><td colspan="4">-6 dB 1 kΩ unbalance (high impedance)</td></tr>
<tr><td>Video input level</td><td colspan="4">0.5-2.0 V P-P</td></tr>
<tr><td>Audio input level</td><td colspan="4">-10 dBV</td></tr>
<tr><td>Video S/N ratio</td><td colspan="4">40 dB or more</td></tr>
<tr><td>Audio S/N ratio</td><td colspan="4">36 dB or more</td></tr>
<tr><td>Hi-fi audio</td><td colspan="4">Frequency characteristic: 20-20,000 Hz<br>Dynamic range: 70 dB or more</td></tr>
<tr><td rowspan="4">DVD section</td><td>Disc used</td><td colspan="4">DVD video disc, Music CD disc</td></tr>
<tr><td>Audio frequency characteristic</td><td colspan="4">DVD (linear audio)<br>20 Hz - 22 kHz (48 kHz sampling frequency)<br>20 Hz - 44 kHz (96 kHz sampling frequency)<br>Music CD<br>20 Hz - 20 kHz (JEITA)</td></tr>
<tr><td>Signal/Noise (S/N) ratio</td><td colspan="4">CD: 70 dB (JEITA)</td></tr>
<tr><td>Dynamic range</td><td colspan="4">DVD (linear audio): 70 dB, CD: 70 dB (JEITA)</td></tr>
<tr><td>Total distortion ratio</td><td colspan="4">DVD: 0.1%, CD: 0.1%</td></tr>
<tr><td rowspan="8">Terminal</td><td>Antenna input</td><td colspan="4">DIN (input) terminal</td></tr>
<tr><td>Antenna output</td><td colspan="4">DIN (output) terminal</td></tr>
<tr><td>Video input</td><td colspan="4">SCART JACK (AV 1, 2) FRONT PIN JACK</td></tr>
<tr><td>Video output</td><td colspan="4">SCART JACK (AV 1, 2)</td></tr>
<tr><td>Audio input</td><td colspan="4">SCART JACK (AV 1, 2) FRONT PIN JACK</td></tr>
<tr><td>Audio output</td><td colspan="4">SCART JACK (AV 1, 2) PIN JACK (REAR)</td></tr>
<tr><td>S Video output</td><td colspan="4">MINI DIN 4PIN JACK (75 Ω)</td></tr>
<tr><td>Optical digital audio output</td><td colspan="4">Optical connector</td></tr>
<tr><td rowspan="5">Others</td><td>Coaxial digital audio output</td><td colspan="4">PIN JACK</td></tr>
<tr><td>Power supply</td><td colspan="4">AC 220-240 V - +/-10%, 50 Hz+/-0.5%</td></tr>
<tr><td>Power consumption</td><td colspan="4">30 W (Standby: 9.0 W)</td></tr>
<tr><td>Retention at power failure</td><td colspan="4">30 s</td></tr>
<tr><td>Temperature range for operation</td><td colspan="4">5 °C - 40 °C</td></tr>
<tr><td>Dimensions</td><td colspan="4">435(W) mm x 99(H) mm x 218(D) mm</td></tr>
<tr><td>Weight</td><td colspan="4">3.8 kg</td></tr>
</table>

# 2-2 COMPARISON OF MODELS

## 2-2-1 General

: The halftone parts are the differences from the previous model.

| ITEM | | DV-PF3E/PF3E(UK) | DV-PF2E/PF2E(UK) |
|---|---|---|---|
| APPEARANCE | Dimensional | 435(W) x 99(H) x 218(D)mm | 435(W) x 99(H) x 266(D)mm |
| | Weight | 3.8kg | 4.0kg |
| | Power Consumption | 30W (standby: 9.0W) | 30W (standby: 5.7W) |
| | Tray Panel | Silver | Silver |
| | Color Front/BUtton | Silver/Silver | Silver/Silver |
| | Hot Stamp | --- | --- |
| REMOTE CONTROLLER | Remote Controller Model Name | DV-RMPF3E (DV-PF3E)<br>DV-RMPF3E(UK) (DV-PF3E(UK)) | DV-RMPF2E (DV-PF2E)<br>DV-RMPF2E(UK) (DV-PF2E(UK)) |
| | Jog Shuttle on Remote | --- | --- |
| | TV Control | --- | --- |

## 2-2-2 VCR Section

: The halftone parts are the differences from the previous model.

| ITEM | | DV-PF3E/PF3E(UK) | DV-PF2E/PF2E(UK) |
|---|---|---|---|
| VIDEO | Video Format | VHS | VHS |
| | Y/C Separation | Comb Filter | Comb Filter |
| | YNR (Luminance Noise Reduction) Circuit | O | O |
| | New Synchronize Circuit | --- | --- |
| | Picture Control | O | O |
| INPUT/ OUTPUT | Video/Audio Input (Rear) | 2/2 (AV1/AV2) | 2/2 (AV1/AV2) |
| | Video/Audio Input (Front) | 1/1 (AV3) | 1/1 (AV3) |
| | Video/Audio Output (Rear) | 2/2 (AV1/AV2) | 2/2 (AV1/AV2) |
| OTHER | OSD languages (VCR) | 7 (English, French, Spanish, Italian, German, Dutch, Swedish) [DV-PF3E]<br>1 (English) [DV-PF3E(UK)] | 7 (English, French, Spanish, Italian, German, Dutch, Swedish) [DV-PF2E]<br>1 (English) [DV-PF2E(UK)] |
| | Stereo CM Skip Feature | --- | --- |
| | Auto Clock Feature | O | O |
| | Number of Timer Programming | 8 Program/year | 8 Program/year |
| | Self Diagnosis Function | O (4 Modes) | --- |
| | Back-up Time | 30 s | 60 s |
| | SQPB | --- | --- |
| | Surge Absorber | --- | --- |
| | Auto Power Off Feature | O | O |
| | Local Broadcast Setting | O | O |
| | Multi Search Feature | O (Index, Time Search, Quick Find) | O (Index, Time Search, Quick Find) |
| MECHANISM | Search Speed | SP: X5/X7<br>LP: X5/X11 | SP: X5/X7<br>LP: X5/X11 |
| | FF/REW Time (E-180 Tape) | FF: approx. 100 s, REW: approx. 100 s | FF: approx. 100 s, REW: approx. 100 s |
| | Head Composition | DA4+Hi-Fi<br>SP: 2[49/49 μm]<br>LP: 2[25/25 μm]<br>Hi-Fi Audio: 2[28/28 μm] | DA4+Hi-Fi<br>SP: 2[49/49 μm]<br>LP: 2[25/25 μm]<br>Hi-Fi Audio: 2[28/28 μm] |
| | Head Material | SP: Ferrite<br>LP: Ferrite<br>Hi-Fi Audio: Ferrite | SP: Ferrite<br>LP: Ferrite<br>Hi-Fi Audio: Ferrite |

## 2-2-3 DVD Section

: The halftone parts are the differences from the previous model.

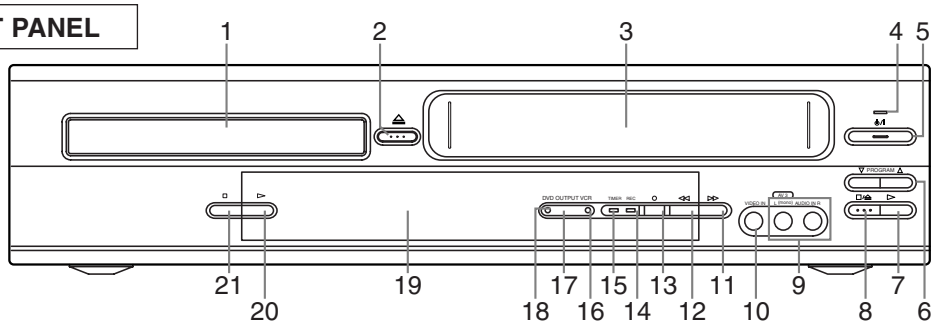
| ITEM | | DV-PF3E/PF3E(UK) | DV-PF2E/PF2E(UK) |
|---|---|---|---|
| GENERAL | Drive Speed | 1x | 1x |
| | Laser | 2 | 2 |
| | DVD/VCD/SVCD/CD-DA | O / --- / --- / O | O / --- / --- / O |
| | CD-R/CD-RW/DVD-R (Video Format) | O / O / O | O / O / O |
| | DVD-RAM (VR Format) | --- | --- |
| | MP3 | O | O |
| | OSD languages (DVD) | 7 (English, French, Spanish, Italian, German, Dutch, Swedish) | 7 (English, French, Spanish, Italian, German, Dutch, Swedish) |
| | Jog Shuttle on Front | --- | --- |
| | Headphone Jack / Volume | ---/--- | ---/--- |
| VIDEO | PAL Disc NTSC Out | --- | --- |
| | Video Out Mode NTSC/PAL/PAL60 | --- / O / O | --- / O / O |
| | S-Video / Component / Composite | O / --- / O | O / --- / O |
| | Video D/A Converter | 10bit | 10bit |
| | Black Level Select | --- | O |
| | Picture Control | --- | --- |
| | Progressive Out | --- | --- |
| AUDIO | Audio D/A Converter | 192kHz / 24bit | 192kHz / 24bit |
| | Digital Audio Out Optical / Coaxial | O / O | O / O |
| | Dolby Digital 5.1 ch Decode | --- | --- |
| | DTS Digital Out | O | O |
| | Virtual Surround | O | O |
| | Dynamic Range Compression (Dolby Digital) | O | O |
| | DVD Audio | --- | --- |
| | Power on sound | --- | --- |
| TRICK PLAY | Search Speed | 2 to 100 (FORWARD/REWIND) (DVD: 2, 8, 50, 100/CD: 16) | 2 to 60 (FORWARD/REWIND) (DVD: 2, 8, 30, 60/CD: 16) |
| | Slow Speed | 1/16, 1/8, 1/2 (FORWARD/REWIND) | 1/16, 1/8, 1/2 (FORWARD only) |
| | IP Search (Smooth 2x Play) | O | O |
| | 2x Play with Audio | --- | --- |
| | Step Forward / Reverse | O / --- | O / --- |
| | Still Picture Select (Frame/Field) | Auto Only | Auto Only |
| FEATURES | Disc Navigation | O | --- |
| | DVD Zoom x2 / x4 | O / O | O / O |
| | Program and Random Play of DVD | O | O |
| | A-B Repeat | O | O |
| | Repeat | O | O |
| | Last Play | --- | O |
| | Front Panel Display Dimmer | --- | O |
| | Screen Saver | O | O |
| | Auto Power Off | O | O |

# 2-3 OPERATING CONTROLS AND FUNCTIONS

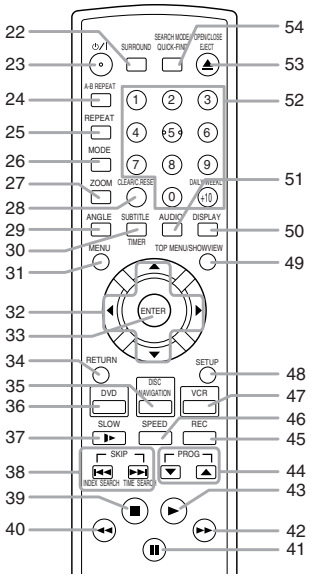
## [ DV-PF3E ]

## OPERATING CONTROLS AND FUNCTIONS

### FRONT PANEL




### REMOTE CONTROL




1. **Disc loading tray**
2. **OPEN/CLOSE Button(DVD)**
   Press to insert discs into or remove them from the tray.
3. **CASSETTE COMPARTMENT**
4. **POWER Light**
   Lights up when the power is on.
5. **POWER/STANDBY Button**
   Press to turn the power on and off.
   (As to the indication of the Operate switch, " I " indicates ON and " ⏻ " indicates electrical power STAND-BY.)
6. **PROGRAM (▲/▼) Buttons**
   In VCR mode, press to change TV programmes on the VCR; press to adjust the tracking during normal or slow motion playback; press to remove vertical jitter in a Still picture.
7. **PLAY Button(VCR)**
   Press to begin playback.
8. **STOP/EJECT Button (VCR)**
   **EJECT Button**
   Press to remove the tape from the VCR.
   **STOP Button**
   Press to stop the tape motion.
9. **AUDIO In Jacks**
   Connect audio cables coming from the audio out jacks of a camcorder, another VCR, or an audio source here.
10. **VIDEO In Jack**
    Connect a video cable coming from the video out jack of a camcorder, another VCR, or a video source (laser disc player, camcorder, etc.) here.
11. **F.FWD Button (VCR)**
    Press to rapidly advance the tape, or view the picture rapidly in forward during playback. (Forward Search).
12. **REW Button (VCR)**
    Press to rewind the tape, or to view the picture rapidly in reverse during the playback mode (Rewind Search).
13. **REC Button (VCR)**
    Press once to start a recording. Press repeatedly to start a One Touch Recording.
14. **REC Light**
    Lights up during recording.
15. **TIMER Light**
    This light glows when the DVD/VCR is in standby mode for a timer recording or during a One Touch Recording. It flashes if TIMER is pressed for a timer recording, but there is no tape in the DVD/VCR. It flashes when all timer recordings or One Touch Recording are finished.
16. **VCR OUTPUT Light (Green)**
    This light appears when the VCR output mode is selected. You can only watch tapes when the green VCR OUTPUT light is on. To make the green VCR OUTPUT light come on, VCR on the remote control or OUTPUT on the front panel.
17. **OUTPUT Button**
    Press to select DVD mode or VCR mode.
    - You can switch the output mode either by pressing OUTPUT on the front panel, or by pressing DVD or VCR on the remote control. However, **if you press OUTPUT on the front panel first, you need to re-select the corresponding mode by pressing DVD or VCR on the remote control.**
18. **DVD OUTPUT Light (Green)**
    This light appears when the DVD output mode is selected. You can only watch DVDs when the green DVD OUTPUT Light is on. To make the green DVD OUTPUT light come on, press DVD on the remote control or OUTPUT on the front panel.
19. **Display, Remote Sensor Window**
20. **PLAY Button (DVD)**
    Press to begin playback.
21. **STOP Button (DVD)**
    Stops operation of the disc.
22. **SURROUND Button**
    Press to activate the virtual surround.
23. **⏻/I(POWER/STANDBY) Button**
    Press to turn the power on and off.
    (As to the indication of the Operate switch, " I " shows ON and " ⏻/I" shows electrical power stand-by.)
24. **A-B REPEAT Button**
    Repeats playback of a selected section.
25. **REPEAT Button**
    Repeats playback of the current disc, title, chapter or track.
26. **MODE Button**
    Activates programme playback or random playback mode when playing CDs or MP3. Sets virtual surround.

**27. ZOOM Button**
Enlarges part of a DVD-reproduced image.

**28. CLEAR/C.RESET Button**
- **DVD mode**
  Press to reset the setting.
- **VCR mode**
  Press to reset the counter.

**29. ANGLE Button**
Press to change the camera angle to see the sequence being played back from a different angle.

**30. SUBTITLE Button**
Press to select the desired subtitle language.

**TIMER Button**
Press to put the VCR into standby mode for a timer recording.

**31. MENU Button**
- **DVD mode**
  Press to display the menu of the Disc.
- **VCR mode**
  Press to access the VCR menu.

**32. Arrow Buttons**
- **DVD mode**

**▼ / ▲ / ► / ◄ Buttons**
Move the cursor and determines its position.
- **VCR mode**

**▼ / ▲ Buttons**
Press to enter digits when setting programme (For example: setting clock or timer programme). Press to select the setting modes from the on screen menu.

**►Button**
When setting programme (For example: setting clock or timer programme), press to determine your selection and proceed to the next step you want to input. Press to determine the setting modes from the on screen menu.

**◄Button**
Press to cancel a setting of timer programme. Press to correct digits when setting programme (For example: setting clock or timer programme).

**33. ENTER Button (DVD)**
Press to accept a setting.

**34. RETURN Button (DVD)**
Returns to the previous operation.

**35. DISC NAVIGATION Button**
Press to display the first scenes of each chapter of the title being played.

**36. DVD Button**
Press to select DVD mode for the remote control.
- You can switch the OUTPUT mode either by pressing OUTPUT on the front panel, or by pressing DVD or VCR on the remote control. However, **if you press OUTPUT on the front panel first, you need to re-select the corresponding mode by pressing DVD or VCR on the remote control.**

**37. SLOW Button**
During tape playback, press to view the video tape in slow motion. Press again to resume normal playback. This button does not affect DVD playback.

**38. SKIP ( |◄◄ ►►| )Buttons**
- **DVD mode**
  Press to skip Chapters or Tracks.
- **INDEX SEARCH Button (VCR)**
  Press to perform Index Search.
- **TIME SEARCH Button (VCR)**
  Press to perform Time Search.

**39. STOP ( ■ ) Button**
- **DVD mode**
  Press to stop the disc motion.
- **VCR mode**
  Press to stop the tape motion.

**40. ◄◄ Button**
- **DVD mode**
  Press to view the DVD picture in fast reverse motion or to reverse playback of an Audio CD.
- **VCR mode**
  Press to rewind the tape, or to view the picture rapidly in reverse during the playback mode (Rewind Search).

**41. PAUSE/STEP (❚❚) Button**
- **DVD mode**
  Press to pause Disc playback. Press repeatedly to advance the DVD picture step by step (or one frame at a time).
- **VCR mode**
  While recording, press to temporarily stop the recording (pause). Press a second time to resume normal recording. You can not pause a One Touch Recording. Or, press during tape playback to freeze the picture. Press to advance the picture one frame at a time during still mode.

**42. ►► Button**
- **DVD mode**
  Press to fast forward the Disc. Press PAUSE/STEP, then press this button to begin slow motion playback. Press this button repeatedly to change the forward speed of slow motion.
- **VCR mode**
  Press to rapidly advance the tape, or view the picture rapidly in forward during playback (Forward Search).

**43. PLAY (►) Button**
- **DVD mode**
  Press to begin playback.
- **VCR mode**
  Press to begin playback.

**44. PROG (▲/▼) Button**
Press to change TV channels on the DVD/VCR.
Press to adjust the tracking during normal or slow motion playback; press to remove vertical jitter in a still picture.

**45. REC Button (VCR)**
Press once to start a recording.

**46. SPEED Button**
Press to select the VCR's recording speed (SP or LP)

**47. VCR Button**
Press to select VCR mode for the remote control.
- You can switch the OUTPUT mode either by pressing OUTPUT on the front panel, or by pressing DVD or VCR on the remote control. However, **if you press OUTPUT on the front panel first, you need to re-select the corresponding mode by pressing DVD or VCR on the remote control.**

**48. SETUP Button**
Press to enter the setup mode.

**49. TOP MENU Button (DVD)**
Press to bring up the Top Menu on a disc.

**SHOWVIEW Button (VCR)**
Press to programme timer recording with the SHOWVIEW system.

**50. DISPLAY Button**
- **DVD mode**
  Press to access or remove the display screen during DVD or Audio CD playback.
- **VCR mode**
  Press to access or remove the VCR's On screen status display.

**51. AUDIO Button**
- **DVD mode**
  Press to select a desired audio language or sound mode.
- **VCR mode**
  Press to select a desired sound mode.

**52. Number Buttons**
- **DVD mode**
  Press to directly select a Track (Audio CD) for playback.

**+10 Button:**
When searching a TITLE, a CHAPTER, or a TRACK, use this button to enter numbers 10 and above. For example when entering '15', press this button first ,then '5'.

● **VCR mode**
Press to select TV channels on the VCR.
To select channels, enter channel numbers as a two-digit number for the quickest results. For example, to select channel 6, press 0 then 6.

**DAILY/WEEKLY/Button :**
Press to select once, daily, everyday, or weekly when you programme the automatic timer recording using the SHOWVIEW system.

**53. OPEN/CLOSE Button (DVD)**
Press to open or close the disc loading tray.

**EJECT Button (VCR)**
Press to eject the video cassette from the VCR.

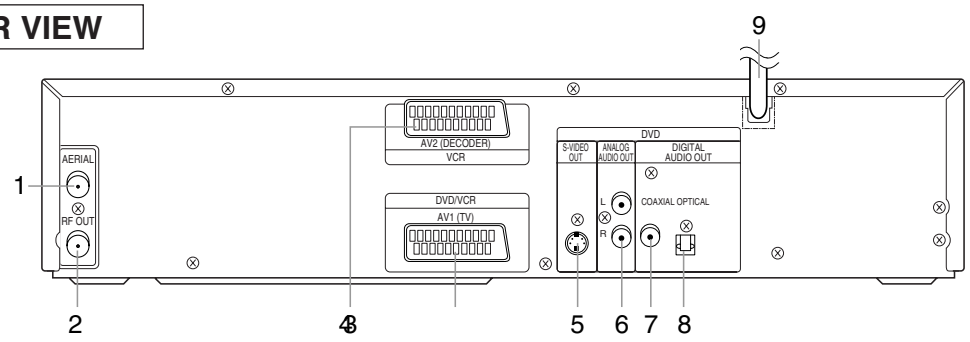
**54. SEARCH MODE/QUICK-FIND Button**

● **DVD mode**
Press to access or remove the Search display, which allows you to go directly to a specific Title/Chapter/Track/Time.

● **VCR mode**
Press to use Quick-Find mode.

**Caution: Do not touch the inner pins of the jacks on the rear panel. Electrostatic discharge may cause permanent damage to the DVD/VCR.**

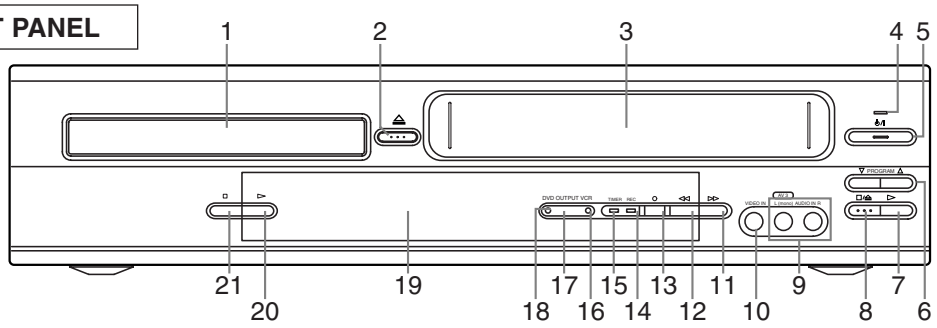
## REAR VIEW



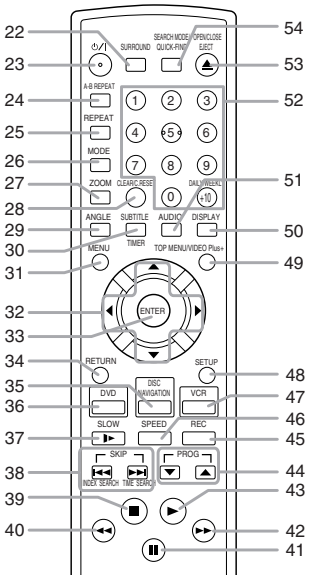

1. **AERIAL Jack**
Connect your antenna, Cable Box, or Direct Broadcast System.
2. **RF OUT Jack**
Use the supplied aerial cable to connect this jack to the ANTENNA IN Jack on your TV.
3. **AV2 (DECODER) Socket**
Connect 21-Pin scart cable here and to the 21-Pin scart jack of a decoder.
4. **AV1 (TV) Socket**
Connect 21-Pin scart cable here and to the 21-Pin scart jack of a TV.
5. **S-VIDEO OUT Jack (DVD only)**
Connect an optional S-Video cable here and to the S-Video In jack of a television.
6. **ANALOG AUDIO OUT Jacks (DVD only)**
Connect the supplied audio cables here and to the Audio In jacks of a television or other audio equipment.
7. **DIGITAL COAXIAL AUDIO OUT Jack (DVD only)**
Connect an optional coaxial digital audio cable here and to the Coaxial Digital Audio In jack of a decoder or audio receiver.
8. **DIGITAL OPTICAL AUDIO OUT Jack (DVD only)**
Connect an optional optical digital audio cable here and to the Optical Digital Audio In jack of a decoder or audio receiver.
9. **AC POWER CORD**
Connect to a standard AC outlet to supply power to the DVD/VCR.

# OPERATING CONTROLS AND FUNCTIONS

## FRONT PANEL




## REMOTE CONTROL




1. **Disc loading tray**
2. **OPEN/CLOSE Button(DVD)**
   Press to insert discs into or remove them from the tray.
3. **CASSETTE COMPARTMENT**
4. **POWER Light**
   Lights up when the power is on.
5. **POWER/STANDBY Button**
   Press to turn the power on and off.
   (As to the indication of the Operate switch, " I " indicates ON and " ⏻ " indicates electrical power STAND-BY.)
6. **PROGRAM (▲/▼) Buttons**
   In VCR mode, press to change TV programmes on the VCR; press to adjust the tracking during normal or slow motion playback; press to remove vertical jitter in a Still picture.
7. **PLAY Button(VCR)**
   Press to begin playback.
8. **STOP/EJECT Button (VCR)**
   **EJECT Button**
   Press to remove the tape from the VCR.
   **STOP Button**
   Press to stop the tape motion.
9. **AUDIO In Jacks**
   Connect audio cables coming from the audio out jacks of a camcorder, another VCR, or an audio source here.
10. **VIDEO In Jack**
    Connect a video cable coming from the video out jack of a camcorder, another VCR, or a video source (laser disc player, camcorder, etc.) here.
11. **F.FWD Button (VCR)**
    Press to rapidly advance the tape, or view the picture rapidly in forward during playback. (Forward Search).
12. **REW Button (VCR)**
    Press to rewind the tape, or to view the picture rapidly in reverse during the playback mode (Rewind Search).
13. **REC Button (VCR)**
    Press once to start a recording. Press repeatedly to start a One Touch Recording.
14. **REC Light**
    Lights up during recording.
15. **TIMER Light**
    This light glows when the DVD/VCR is in standby mode for a timer recording or during a One Touch Recording. It flashes if TIMER is pressed for a timer recording, but there is no tape in the DVD/VCR. It flashes when all timer recordings or One Touch Recording are finished.

16 **VCR OUTPUT Light (Green)**
This light appears when the VCR output mode is selected. You can only watch tapes when the green VCR OUTPUT light is on. To make the green VCR OUTPUT light come on, VCR on the remote control or OUTPUT on the front panel.

17. **OUTPUT Button**
    Press to select DVD mode or VCR mode.
    - You can switch the output mode either by pressing OUTPUT on the front panel, or by pressing DVD or VCR on the remote control. However, **if you press OUTPUT on the front panel first, you need to re-select the corresponding mode by pressing DVD or VCR on the remote control.**
18. **DVD OUTPUT Light (Green)**
    This light appears when the DVD output mode is selected. You can only watch DVDs when the green DVD OUTPUT Light is on. To make the green DVD OUTPUT light come on, press DVD on the remote control or OUTPUT on the front panel.
19. **Display, Remote Sensor Window**
20. **PLAY Button (DVD)**
    Press to begin playback.
21. **STOP Button (DVD)**
    Stops operation of the disc.
22. **SURROUND Button**
    Press to activate the virtual surround.
23. **⏻/I(POWER/STANDBY) Button**
    Press to turn the power on and off.
    (As to the indication of the Operate switch, " I " shows ON and " ⏻/I" shows electrical power stand-by.)
24. **A-B REPEAT Button**
    Repeats playback of a selected section.
25. **REPEAT Button**
    Repeats playback of the current disc, title, chapter or track.
26. **MODE Button**
    Activates programme playback or random playback mode when playing CDs or MP3. Sets virtual surround.
27. **ZOOM Button**
    Enlarges part of a DVD-reproduced image.

28. **CLEAR/C.RESET Button**
    - **DVD mode**
      Press to reset the setting.
    - **VCR mode**
      Press to reset the counter.
29. **ANGLE Button**
    Press to change the camera angle to see the sequence being played back from a different angle.
30. **SUBTITLE Button**
    Press to select the desired subtitle language.
    **TIMER Button**
    Press to put the VCR into standby mode for a timer recording.
31. **MENU Button**
    - **DVD mode**
      Press to display the menu of the Disc.
    - **VCR mode**
      Press to access the VCR menu.
32. **Arrow Buttons**
    - **DVD mode**
      **▼ / ▲ / ▶ / ◀ Buttons**
      Move the cursor and determines its position.
    - **VCR mode**
      **▼ / ▲ Buttons**
      Press to enter digits when setting programme (For example: setting clock or timer programme). Press to select the setting modes from the on screen menu.
      **▶Button**
      When setting programme (For example: setting clock or timer programme), press to determine your selection and proceed to the next step you want to input. Press to determine the setting modes from the on screen menu.
      **◀Button**
      Press to cancel a setting of timer programme. Press to correct digits when setting programme (For example: setting clock or timer programme).
33. **ENTER Button (DVD)**
    Press to accept a setting.
34. **RETURN Button (DVD)**
    Returns to the previous operation.
35. **DISC NAVIGATION Button**
    Press to display the first scenes of each chapter of the title being played.
36. **DVD Button**
    Press to select DVD mode for the remote control.
    - You can switch the OUTPUT mode either by pressing OUTPUT on the front panel, or by pressing DVD or VCR on the remote control. However, **if you press OUTPUT on the front panel first, you need to re-select the corresponding mode by pressing DVD or VCR on the remote control.**
37. **SLOW Button**
    During tape playback, press to view the video tape in slow motion. Press again to resume normal playback. This button does not affect DVD playback.
38. **SKIP ( |◀◀ ▶▶| )Buttons**
    - **DVD mode**
      Press to skip Chapters or Tracks.
    - **INDEX SEARCH Button (VCR)**
      Press to perform Index Search.
    - **TIME SEARCH Button (VCR)**
      Press to perform Time Search.
39. **STOP ( ■ ) Button**
    - **DVD mode**
      Press to stop the disc motion.
    - **VCR mode**
      Press to stop the tape motion.
40. **◀◀ Button**
    - **DVD mode**
      Press to view the DVD picture in fast reverse motion or to reverse playback of an Audio CD.
    - **VCR mode**
      Press to rewind the tape, or to view the picture rapidly in reverse during the playback mode (Rewind Search).
41. **PAUSE/STEP (▮▮) Button**
    - **DVD mode**
      Press to pause Disc playback. Press repeatedly to advance the DVD picture step by step (or one frame at a time).
    - **VCR mode**
      While recording, press to temporarily stop the recording (pause). Press a second time to resume normal recording. You can not pause a One Touch Recording. Or, press during tape playback to freeze the picture. Press to advance the picture one frame at a time during still mode.
42. **▶▶Button**
    - **DVD mode**
      Press to fast forward the Disc. Press PAUSE/STEP, then press this button to begin slow motion playback. Press this button repeatedly to change the forward speed of slow motion.
    - **VCR mode**
      Press to rapidly advance the tape, or view the picture rapidly in forward during playback (Forward Search).
43. **PLAY (▶) Button**
    - **DVD mode**
      Press to begin playback.
    - **VCR mode**
      Press to begin playback.
44. **PROG (▲/▼) Button**
    Press to change TV channels on the DVD/VCR.
    Press to adjust the tracking during normal or slow motion playback; press to remove vertical jitter in a still picture.
45. **REC Button (VCR)**
    Press once to start a recording.
46. **SPEED Button**
    Press to select the VCR's recording speed (SP or LP)
47. **VCR Button**
    Press to select VCR mode for the remote control.
    - You can switch the OUTPUT mode either by pressing OUTPUT on the front panel, or by pressing DVD or VCR on the remote control. However, **if you press OUTPUT on the front panel first, you need to re-select the corresponding mode by pressing DVD or VCR on the remote control.**
48. **SETUP Button**
    Press to enter the setup mode.
49. **TOP MENU Button (DVD)**
    Press to bring up the Top Menu on a disc.
    **VIDEO Plus+ Button (VCR)**
    Press to programme timer recording with the VIDEO Plus+ system.
50. **DISPLAY Button**
    - **DVD mode**
      Press to access or remove the display screen during DVD or Audio CD playback.
    - **VCR mode**
      Press to access or remove the VCR's On screen status display.
51. **AUDIO Button**
    - **DVD mode**
      Press to select a desired audio language or sound mode.
    - **VCR mode**
      Press to select a desired sound mode.
52. **Number Buttons**
    - **DVD mode**
      Press to directly select a Track (Audio CD) for playback.
      **+10 Button:**
      When searching a TITLE, a CHAPTER, or a TRACK, use this button to enter numbers 10 and above. For example when entering '15', press this button first ,then '5'.

● **VCR mode**
Press to select TV channels on the VCR.
To select channels, enter channel numbers as a two-digit number for the quickest results. For example, to select channel 6, press 0 then 6.

**DAILY/WEEKLY/Button :**
Press to select once, daily, everyday, or weekly when you programme the automatic timer recording using the VIDEO Plus+ system.

**53. OPEN/CLOSE Button (DVD)**
Press to open or close the disc loading tray.

**EJECT Button (VCR)**
Press to eject the video cassette from the VCR.

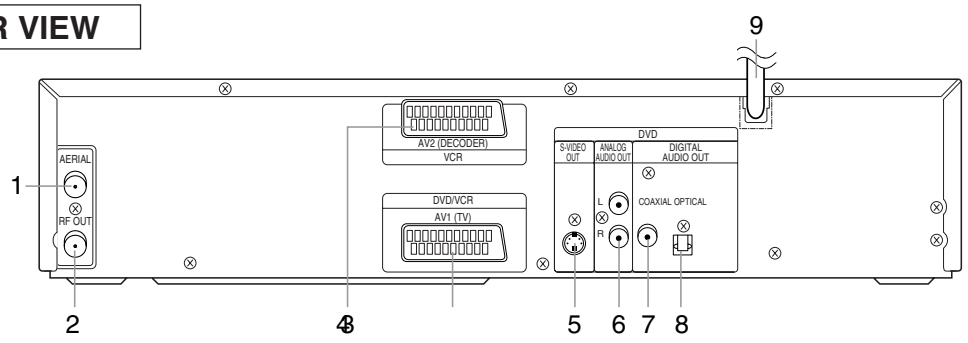
**54. SEARCH MODE/QUICK-FIND Button**

● **DVD mode**
Press to access or remove the Search display, which allows you to go directly to a specific Title/Chapter/Track/Time.

● **VCR mode**
Press to use Quick-Find mode.

**Caution: Do not touch the inner pins of the jacks on the rear panel. Electrostatic discharge may cause permanent damage to the DVD/VCR.**

## REAR VIEW




1. **AERIAL Jack**
Connect your antenna, Cable Box, or Direct Broadcast System.
2. **RF OUT Jack**
Use the supplied aerial cable to connect this jack to the ANTENNA IN Jack on your TV.
3. **AV2 (DECODER) Socket**
Connect 21-Pin scart cable here and to the 21-Pin scart jack of a decoder.
4. **AV1 (TV) Socket**
Connect 21-Pin scart cable here and to the 21-Pin scart jack of a TV.
5. **S-VIDEO OUT Jack (DVD only)**
Connect an optional S-Video cable here and to the S-Video In jack of a television.
6. **ANALOG AUDIO OUT Jacks (DVD only)**
Connect the supplied audio cables here and to the Audio In jacks of a television or other audio equipment.
7. **DIGITAL COAXIAL AUDIO OUT Jack (DVD only)**
Connect an optional coaxial digital audio cable here and to the Coaxial Digital Audio In jack of a decoder or audio receiver.
8. **DIGITAL OPTICAL AUDIO OUT Jack (DVD only)**
Connect an optional optical digital audio cable here and to the Optical Digital Audio In jack of a decoder or audio receiver.
9. **AC POWER CORD**
Connect to a standard AC outlet to supply power to the DVD/VCR.

# 3 MAINTENANCE AND INSPECTION

## 3-1 TROUBLESHOOTING

Troubleshooting is how to service for the specifying malfunction or poor parts.
Detect malfunction or poor parts and service as the following charts.

### 3-1-1 Power Supply Section

**FLOW CHART NO.1**

The power cannot be turned on.

↓

Is the fuse normal? — No → See FLOW CHART No.2 <The fuse blows out.>

↓ Yes

Is normal state restored when once unplugged power cord is plugged again after several seconds. — No → Check for lead or shor-circuiting of primary circuit component and service it if defective. (Q1001,Q1003,T001,D1001,D1002,D1003, D1004,D1011,C1003,C1005)

↓ Yes

Is the AL+5V line voltage normal? — No → (same as above)

↓ Yes

Check each rectifying circuit of secondary circuit and service it if defective.

**FLOW CHART NO.2**

The fuse blows out.

↓

Check the presence that the primary component is leaking or shorted and service it if defective.

Check the presence that the rectifying diode or circuit is shorted in each rectifying circuit of secondary side and service it if defective.

↓

After servicing, replace the fuse.

**FLOW CHART NO.3**

When the output voltage fluctuates.

↓

Does the secondary side photo coupler circuit operate normally? — No → Check the circuit and service it if defective. (IC1001, Q1009, D017)

↓ Yes

Check the circuit and service it if defective. (IC1001, D1012, D1024)

**FLOW CHART NO.4**

When buzz sound can be heard in the vicinity of power circuit.

↓

Check if there is short circuit on the rectifying diode and the circuit in each rectifying circuit of secondary side and service it if defective. (D013,D014,D016,D018,D019,D1008,D1016,D1030,IC1051,IC1052,Q051,Q053,Q055,Q056,Q058, Q1052,Q1053,Q1055)

**FLOW CHART NO.5**

-FL is not outputted.

↓

Is the supply voltage of -30V fed to the anode of D018? — No → Check D018 and their periphery, and service it if defective.

↓ Yes

Check for load circuit short-circuiting or leak, and service it if defective.

**FLOW CHART NO.6**

P-ON+5V is not outputted.

Is 5V voltage supplied to the collector of Q056?

No → Check D016, D017, C017, C018, and their periphery, and service it if defective.

Yes

Is the "H" pulse inputted into the base of Q056?

No → Check Q056, R058, R059, R060 and their periphery, and service it if defective.

Yes

Replace Q056.

**FLOW CHART NO.7**

EV+3.3V is not outputted.

Is 5V voltage supplied to Pin(1) of IC1052?

No → Check D1008, C1007, C1108 and their periphery, and service it if detective.

Yes

Replace IC1004.

**FLOW CHART NO.8**

P-ON+12V is not outputted.

Is 12V voltage supplied to the emitter of Q1053?

No → Check D014, C014, C1105 and their periphery, and service it if detective.

Yes

Is the "L" pulse (approximately 0V) outputted to the collector of Q1054?

No → Check Q1054 and PWRCON line, and service it if detective.

Yes

Replace Q1053.

**FLOW CHART NO.9**

P-ON+3.3V is not outputted. (EV+3.3V is outputted normally.)

Is the "H" pulse (approximately 5V) inputted into the base of Q1052?

No → See FLOW CHART NO.8. <P-ON+12V is not outputted. >

Yes

Replace Q1052.

**FLOW CHART NO.10**

EV 1.5V is not outputted.

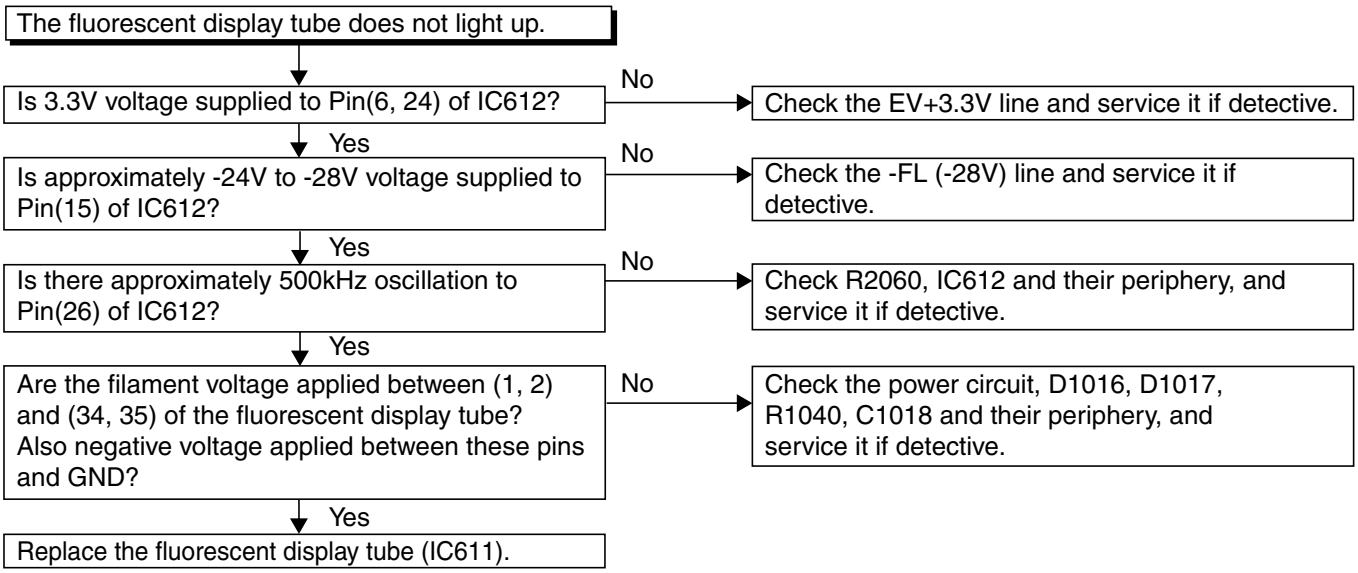
Is approximately 2.35V voltage supplied to Pin(1) of IC1051?

No → Check D1030,C1035,C1107, and their periphery, and service it if detective.

Yes

Replace IC1051.

**FLOW CHART NO.11**



## 3-1-2 DVD Section

**FLOW CHART NO.1**

The key operation is not functioning.

↓

Are the contact point and the installation state of the key switches (SW2020-2022) normal?

No → Re-install the key switches (SW2020, SW2021, SW2022) correctly or replace the poor switch.

↓ Yes

When pressing each key switches (SW2020, SW2021, SW2022), do the voltage of each pin of CN2014 (shown below) change to "L" (0V) from "H" (3.3V)?
SW2020 → CN2014 4PIN
SW2021 → CN2014 2PIN
SW2022 → CN2014 1PIN

No → Check the key switches (SW2020, SW2021, SW2022) and their periphery, and service it if detective.

↓ Yes

Replace DVD Main CBA.

**FLOW CHART NO.2**

No DVD operation is possible from the remote control unit. (Operation is possible from the unit.)

↓

Is 5V voltage supplied to Pin(3) terminal of the RM2001 (remote control receiver)?

No → Check AL+5V line, and service it if detective.

↓ Yes

Is the "L" pulse sent out from Pin(1) terminal of the RM2001 (remote control receiver) when the remote control unit is activated?

No → Replace the RM2001 (remote control receiver). Replace remote control unit if needed.

↓ Yes

Is the "L" pulse signal supplied to Pin(22) of CN1051?

No → Check the line between the RM2001 (remote control receiver) and Pin(22) of CN1051, and service it if detective.

↓ Yes

Replace the DVD Main CBA.

**FLOW CHART NO.3**

The disc tray cannot be opened and closed. (It can be done using the remote control unit.)

↓

Does the voltage of Pin(4) on CN2014 become 0V when pressing "OPEN/CLOSE" button on the unit?

No → Replace the "OPEN/CLOSE" button (SW2020).

↓ Yes

Refer to "FLOW CHAR NO.4" <The disc tray cannot be opened and closed.>

**FLOW CHART NO.4**

The disc tray cannot be opened and closed.

↓

Replace the DVD Main CBA.

↓

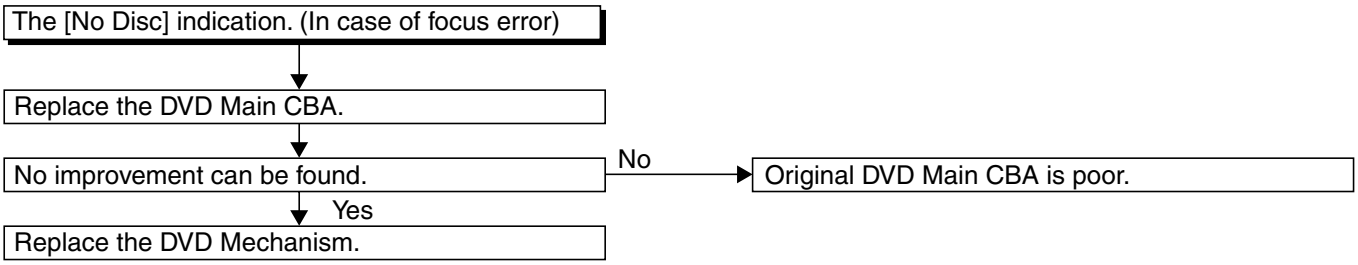
No improvement can be found.

No → Original DVD Main CBA is poor.

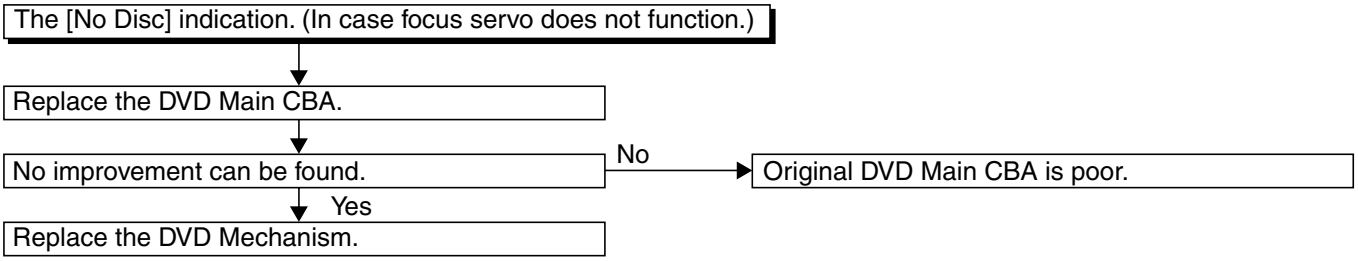
↓ Yes

Replace the DVD Mechanism.

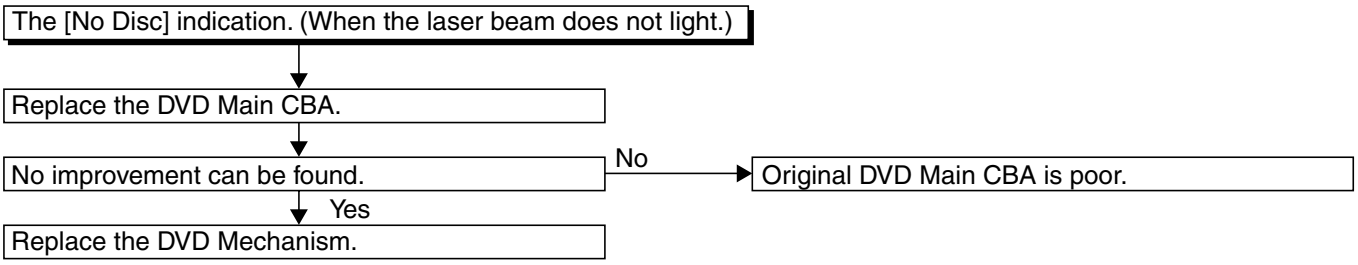
**FLOW CHART NO.5**



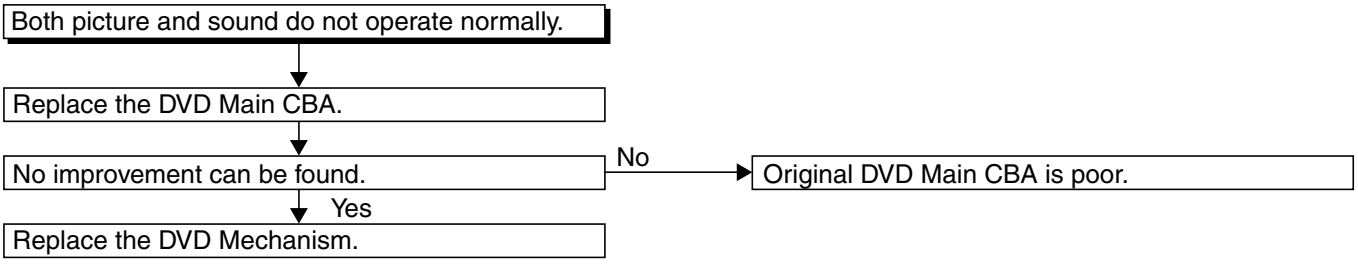

**FLOW CHART NO.6**



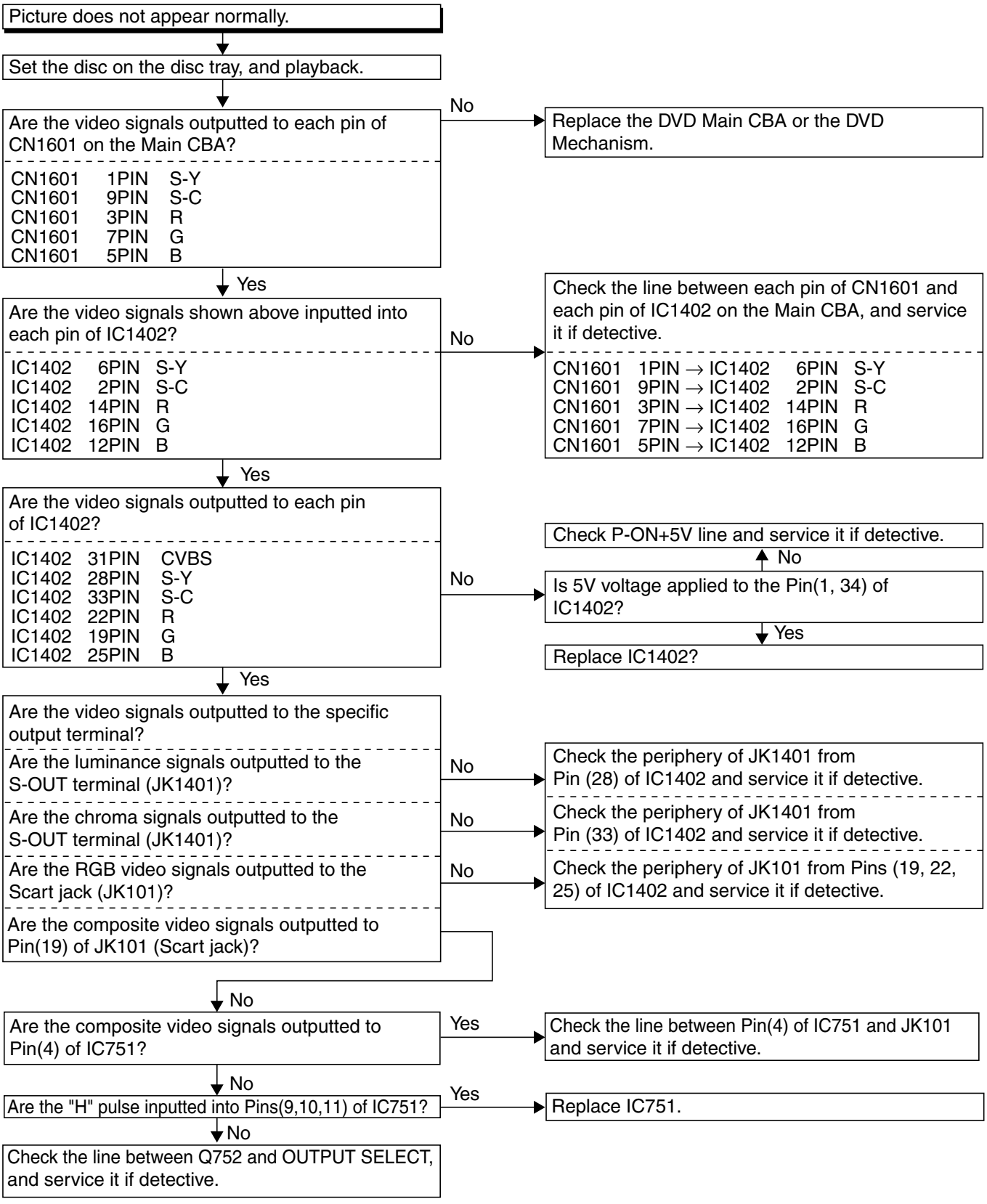

**FLOW CHART NO.7**



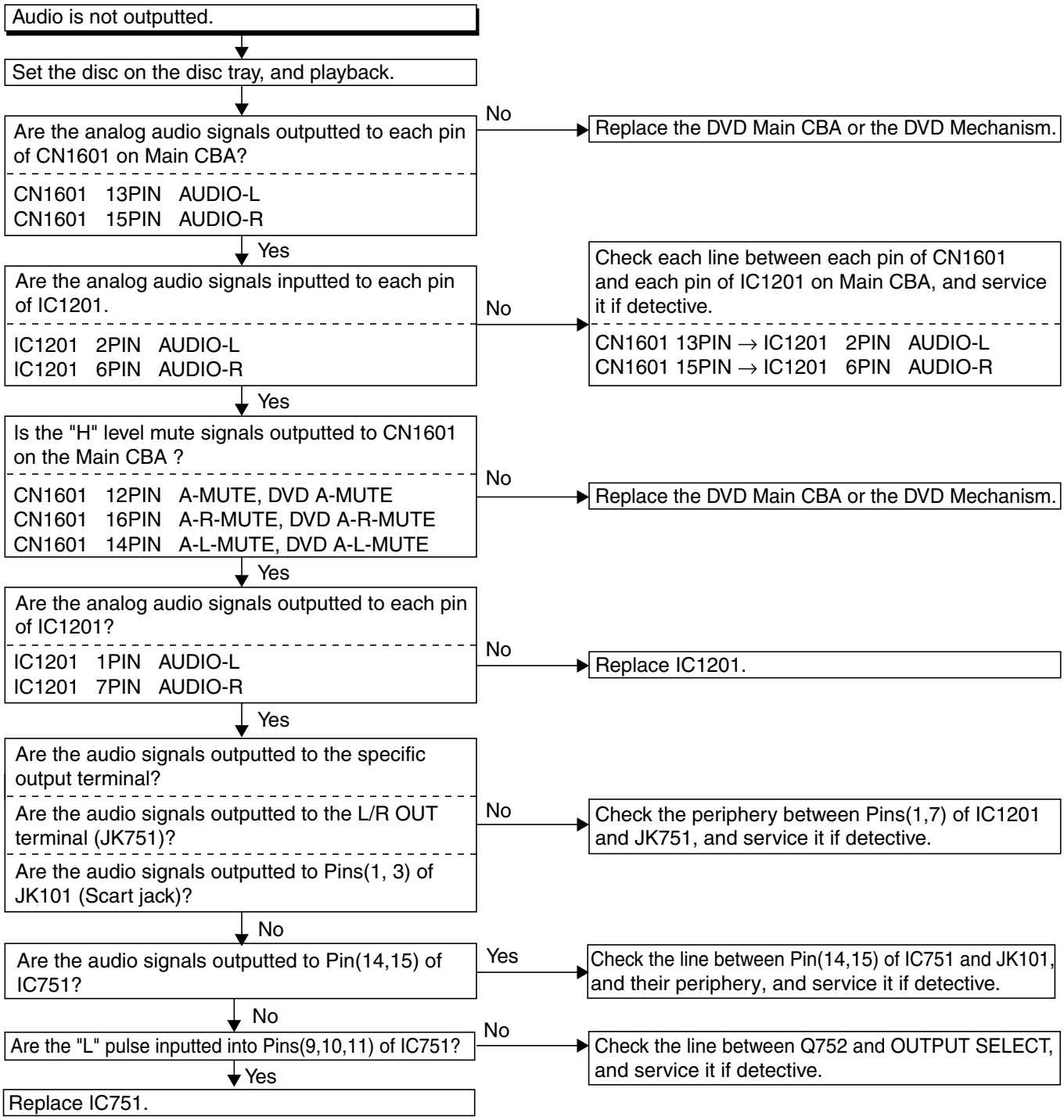

**FLOW CHART NO.8**



**FLOW CHART NO.9**



**FLOW CHART NO.10**



## 3-1-3 VCR Section

**FLOW CHART NO.1**

The key operation is not functioning.

↓

Are the contact point and the installation state of the key switches normal? — No → Re-install some key switches correctly or replace some key switches.

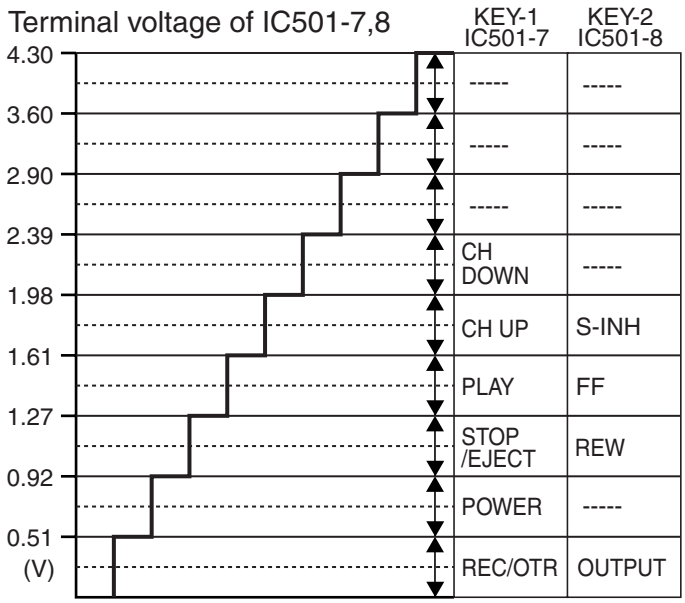
↓ Yes

Is the control voltage normally inputted into Pins(7,8) of IC501? — No → Check the key switches and their periphery, and service it if detective.

↓ Yes

Replace IC501.

Terminal voltage of IC501-7,8




**FLOW CHART NO.2**

No DVD operation is possible from the remote control unit. (Operation is possible from the unit.)

↓

Is 5V voltage supplied to the Pin(3) terminal of the RM2001 (remote control receiver)? — No → Check AL+5V line and service it if detective.

↓ Yes

Is the "L" pulse sent out from Pin(1) terminal of the RM2001 (remote control receiver) when the remote control unit is activated? — No → Replace the RM2001 (remote control receiver). Or replace remote control unit.

↓ Yes

Is the "L" pulse signal supplied to the Pin(14) of IC501? — No → Check the line between the RM2001 (remote control receiver) and the Pin(14) of IC501, and service it if detective.

↓ Yes

Replace IC501.

**FLOW CHART NO.3**

Cassette tape can not be loaded.

When loading a cassette tape, on Pin(10) of IC501, does the "L" pulse switch to the "H" pulse?
- No → Check the line between the start sensor and Pin(10) of IC501, and service it if detective.
- Yes ↓

When loading a cassette tape, is the specified voltage (approximately 13V) outputted to the terminal of the Loading Motor Unit?
- No → Replace the Capstan Motor Unit.
- Yes ↓

Replace the Loading Motor Unit.

**FLOW CHART NO.4**

Cassette tape is ejected right after the loading.

When loading a cassette tape, on Pin(10) of IC501, does the "L" pulse switch to the "H" pulse?
- No → Check the line between the start sensor and Pin(10) of IC501, and service it if detective.
- Yes ↓

When loading a cassette tape, on Pin(4) of IC501, does the "L" pulse switch to the "H" pulse?
- No → Check the line between the end sensor and Pin(4) of IC501, and service it if detective.
- Yes ↓

When loading a cassette tape, does the LD-SW operate normally?
- No → Check the line between the LD-SW(SW507) and Pin(9) of IC501, and service it if detective.
- Yes ↓

Replace IC501.

**FLOW CHART NO.5**

Cassette tape can not be ejected.

When pressing the eject button, does the Capstan Motor start rotating?
- No → Refer to "FLOW CHART NO.6 " <The Capstan Motor does not rotate>.
- Yes ↓

While the Capstan Motor is rotating, is the Takeup Reel rotating?
- No → Check the Reel Disc or Reel Drive Unit, and service it if detective.
- Yes ↓

While the Takeup Reel is rotating, is the reel pulse signal inputted to Pin(80) of IC501?
- No → Check the line between the Takeup Reel sensor and Pin(80) of IC501, and service it if detective.
- Yes ↓

While the reel pulse signal is inputting, is "L" pulse inputted to Pin(81) of IC501?
- No → Replace IC501.
- Yes ↓

Is the specified voltage (approximately 13V) outputted to the terminal of the Lading Motor Unit?
- No → Replace the Capstan Motor unit.
- Yes ↓

Is the Loading Motor rotating?
- No → Replace the Loading Motor unit.
- Yes ↓

Check the Cassette Cam or Cassette Gear, etc, and service it if detective.

**FLOW CHART NO.6**

Capstan Motor does not rotate.

↓

Is 5V voltage supplied to Pin(2) of CL502? — No → Check the P-ON+5V line and service it if detective.

↓ Yes

Is over approximately 2.6V voltage supplied to Pin(5) of CL502? — No → Check the line between Pin(5) of CL502 and Pin(76) of IC501, and service it if detective.

↓ Yes

Is 12V voltage supplied to Pins(1,11) of CL502? — No → Check the AL+12V line and service it if detective.

↓ Yes

Replace the Capstan Motor Unit.

**FLOW CHART NO.7**

Drum Motor does not rotate.

↓

Is 5V voltage supplied to Pin(2) of CL502? — No → Check the P-ON+5V line and service it if detective.

↓ Yes

Is over approximately 2.6V voltage supplied to Pin(8) of CL502? — No → Check the line between Pin(8) of CL502 and Pin(77) of IC501, and service it if detective.

↓ Yes

Is 12V voltage supplied at Pin(1,11) of CL502? — No → Check the AL+12V line and service it if detective.

↓ Yes

Replace the Capstan Motor Unit or Cylinder Assembly.

**FLOW CHART NO.8**

Drum Motor rotates only for a few seconds.

↓

Is the drum PG/FG signal inputted to Pin(90) of IC501? — No → Replace the Capstan Motor Unit or the Cylinder Assembly.

↓ Yes

Is the RF-SW signal outputted to Pin(18) of IC501? — No → Replace IC501.

↓ Yes

Is 12V voltage supplied Pin(1,11) of CL502? — No → Check the AL+12V line and service it if detective.

↓ Yes

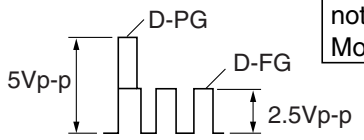
Replace the Capstan Motor Unit or the Cylinder Assembly.

**FLOW CHART NO.9**

RF-SW signal is not outputted.

↓

Is the Drum Motor rotating? — No → Refer to "FLOW CHART NO.7" <Drum Motor does not rotate> and "FLOW CHART NO.8" <Drum Motor rotates only for a few seconds>.



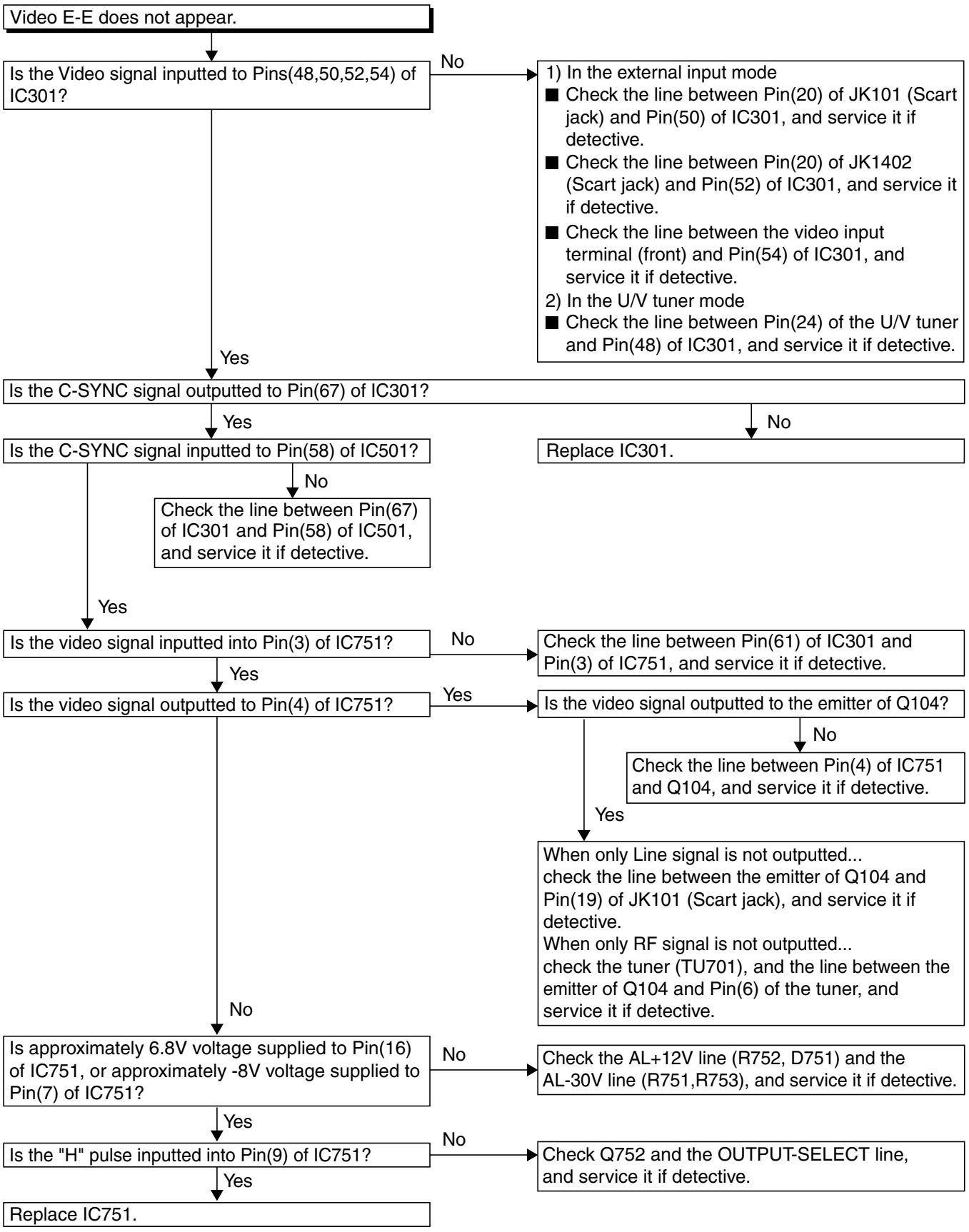

↓ Yes

Is the drum PG/FG signal inputted to Pin(90) of IC501? — No → Replace the Capstan Motor Unit or the Cylinder Assembly.

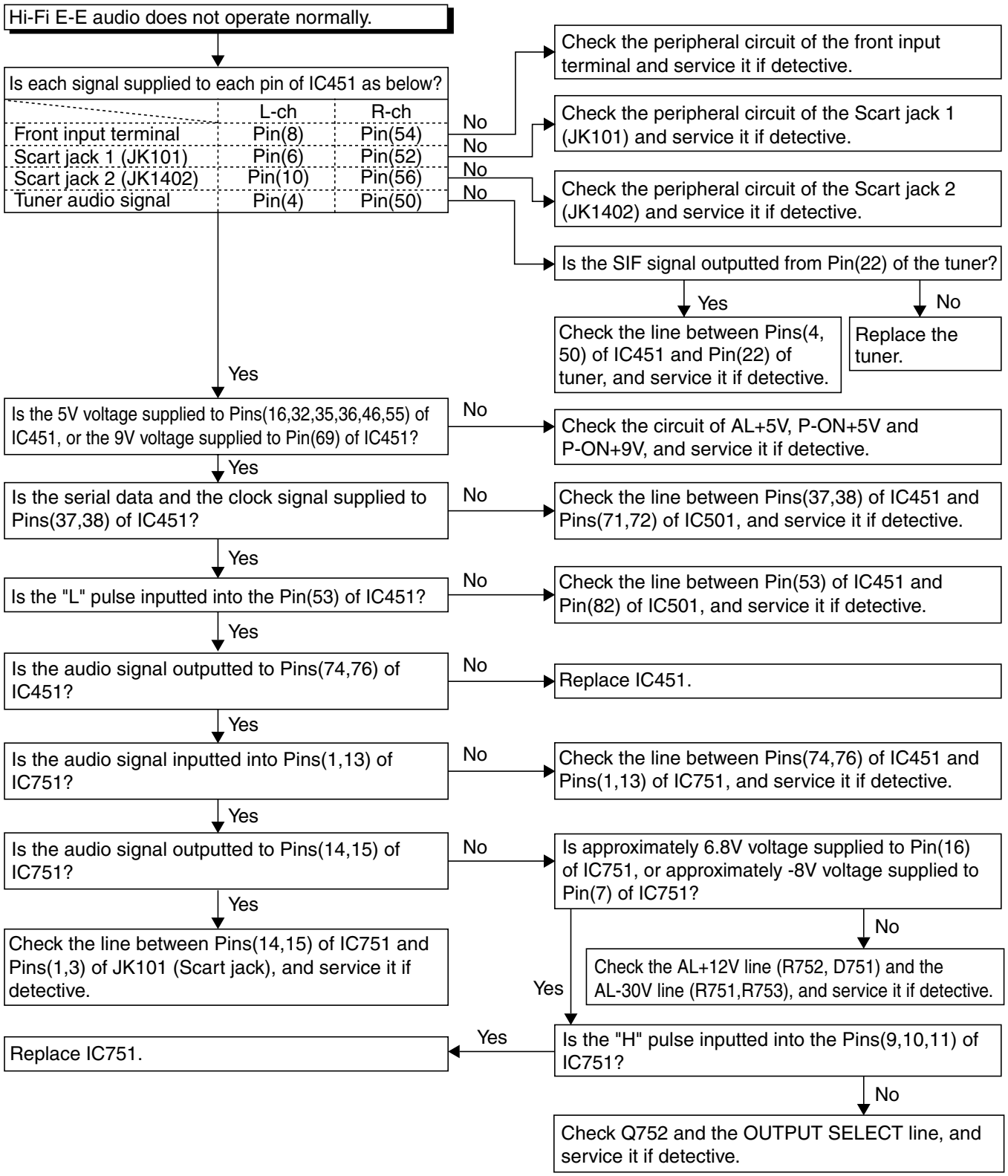
↓ Yes

Replace IC501.

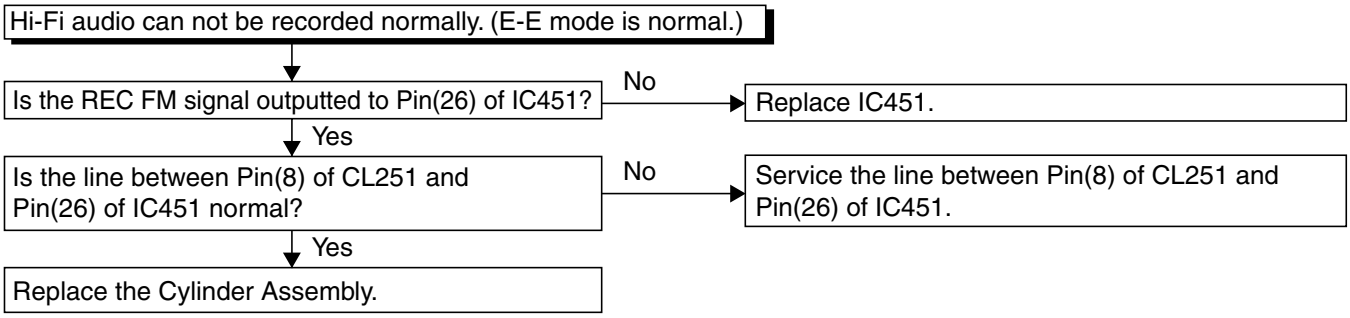
**FLOW CHART NO.10**



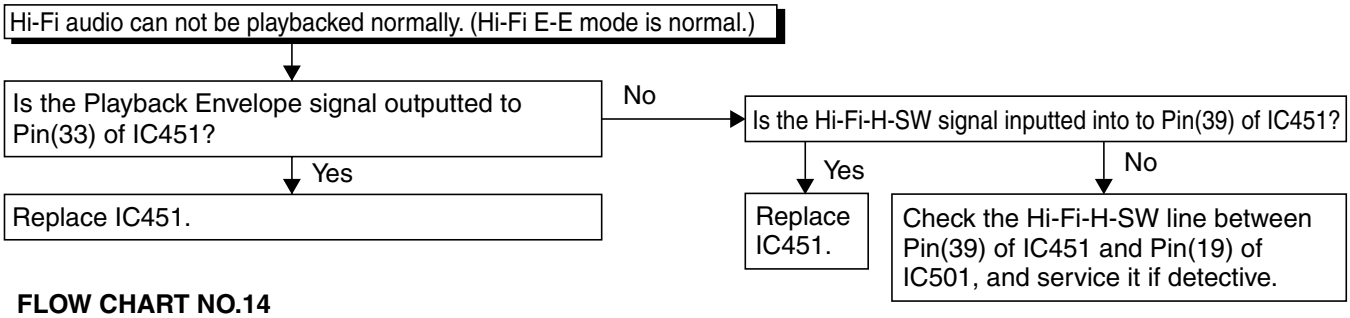
**FLOW CHART NO.11**



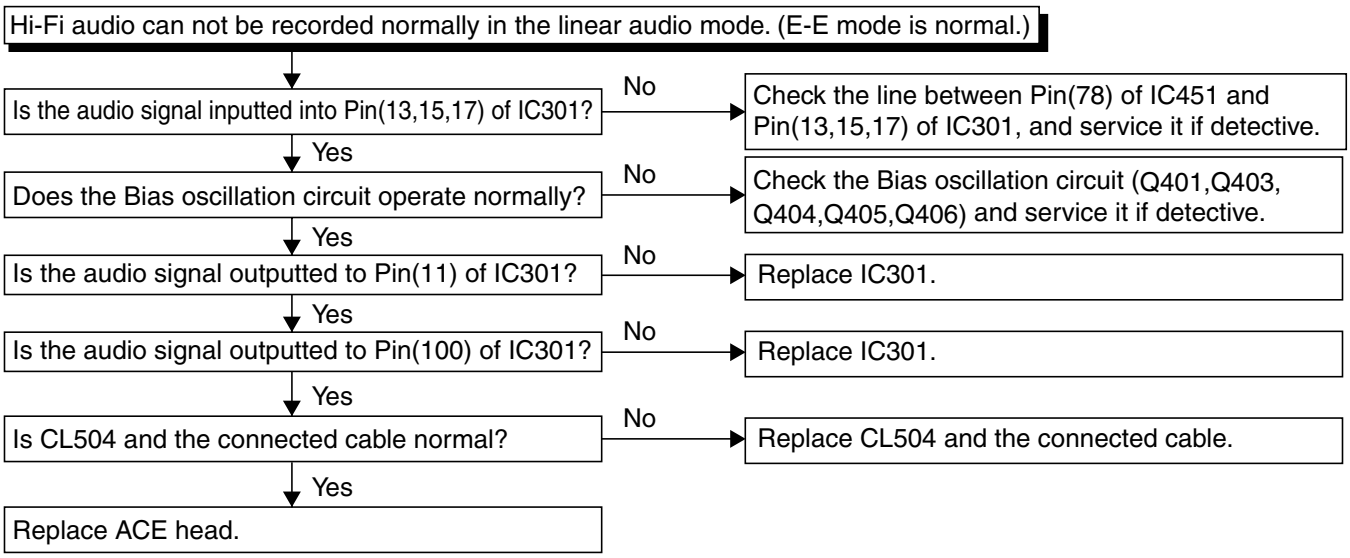
**FLOW CHART NO.12**



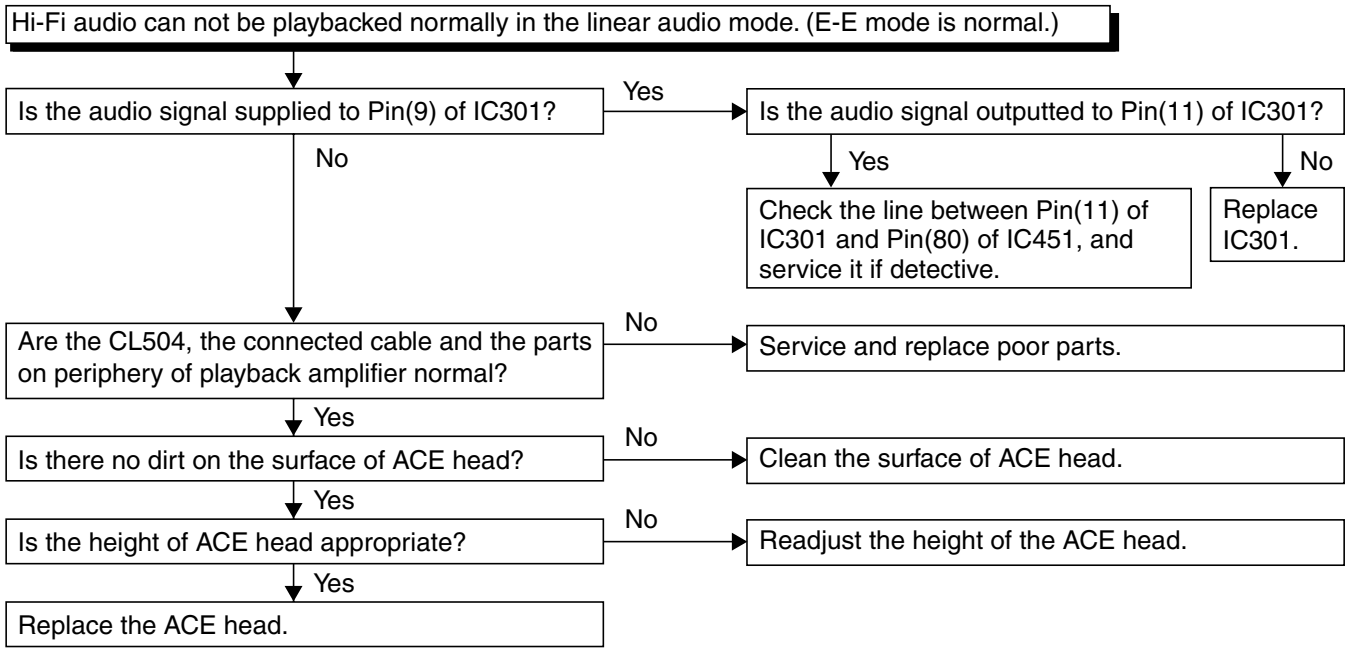

**FLOW CHART NO.13**




**FLOW CHART NO.14**



**FLOW CHART NO.15**



# 3-2 FIRMWARE RENEWAL MODE

## 3-2-1 How to Update the Firmware Version

1. Turn the power on and remove the disc on the tray.
2. To put the DVD player into version up mode, press [9], [8], [7], [6], and [SEARCH MODE] buttons on the remote control unit in that order. The tray will open automatically.
   Fig. 3-2-1 appears on the screen and Fig. 3-2-2 appears on the VFD.
   The DVD player can also enter the version up mode with the tray open. In this case, Fig. 3-2-1 will be shown on the screen while the tray is open.

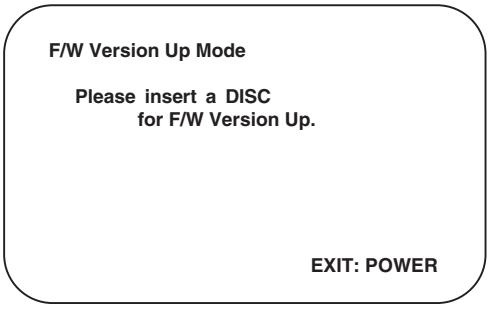



Fig. 3-2-1 Version Up Mode Screen

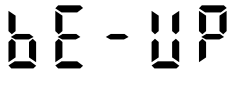



Fig. 3-2-2 VFD in Version Up Mode

3. Load the disc for version up.
4. The DVD player enters the F/W version up mode automatically. Fig. 3-2-3 appears on the screen and Fig. 3-2-4 appears on the VFD.

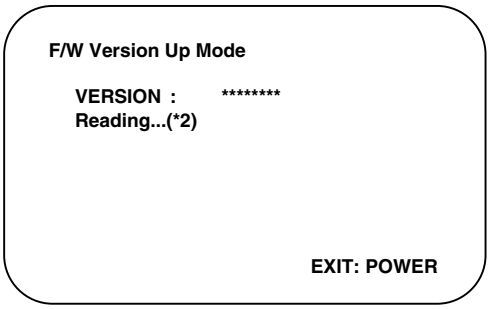



Fig. 3-2-3 Programming Mode Screen


Fig. 3-2-4 VFD in Programming Mode (Example)

The appearance shown in (*2) of Fig. 3-2-3 is described as follows:

| No. | Appearance | State |
|---|---|---|
| 1 | Reading... | Sending files into the memory |
| 2 | Erasing... | Erasing previous version data |
| 3 | Programming... | Writing new version data |

5. After programming is finished, the tray opens automatically. Fig. 3-2-5 appears on the screen and the checksum in (*3) of Fig. 3-2-5 appears on the VFD. (Fig. 3-2-6)
   At this time, no buttons are available.

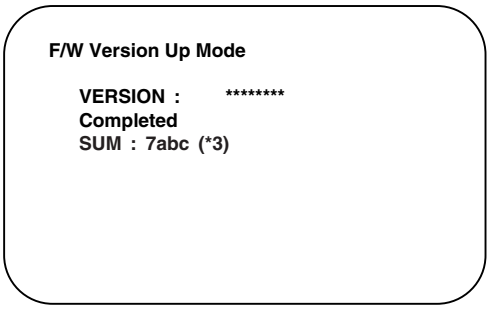



Fig. 3-2-5 Completed Program Mode Screen


Fig. 3-2-6 VFD upon Finishing the Programming Mode (Example)

6. Unplug the AC cord from the AC outlet. Then plug it
7. To finish this mode, press [POWER] button.

## 3-2-2 How to Verify the Firmware Version

1. After making sure that no disc is in unit, turn the power on.
2. Press [1], [2], [3], [4], and [DISPLAY] buttons on the remote control unit in that order. The B/E version appears on the VFD, and the F/E and B/E versions appear on TV screen.
3. Turn the power off to reset the unit.

**Note:**
If the firmware has been changed, etc., we will use Service News, etc. to report on how to obtain new firmware data and create an upgraded disc.

# 3-3 STANDARD MAINTENANCE

## 3-3-1 Service Schedule of Components

h: Hours ❍: Check ●: Change

| Deck | | Periodic Service Schedule | | | |
|---|---|---|---|---|---|
| **Ref.No.** | **Part Name** | **1,000 h** | **2,000 h** | **3,000 h** | **4,000 h** |
| B2 | Cylinder Assembly | ❍ | ● | ❍ | ● |
| B3 | Loading Motor Assembly | | | ● | |
| B8 | Pulley Assembly (HI) | | ● | | ● |
| B587 | Tension Lever Assembly | | ● | | ● |
| B31 | AC Head Assembly | | | ● | |
| B573, B574 | Reel S, Reel T | | | ● | |
| B37 | Capstan Motor | | ● | | ● |
| B52 | Cap Belt | | ● | | ● |
| B73 | FE Head Assembly | | | ● | |
| B86 | F Brake Assembly (HI) | | ● | | ● |
| B133 | Idler Assembly (HI) | | ● | | ● |
| B410 | Pinch Arm Assembly | | ● | | ● |
| B414 | M Brake (SP) Assembly (HI) | | ● | | ● |
| B416 | M Brake (TU) Assembly (HI) | | ● | | ● |
| B525 | LDG Belt | | ● | | ● |

**Notes:**

1. Clean all parts for the tape transport (Upper Drum with Video Head / Pinch Roller / Audio Control Head / Full Erase Head) using 90% Isopropyl Alcohol.
2. After cleaning the parts, do all DECK ADJUSTMENTS.
3. For the reference numbers listed above, refer to Deck Exploded Views.

## 3-3-2 Cleaning

### Cleaning of Video Head

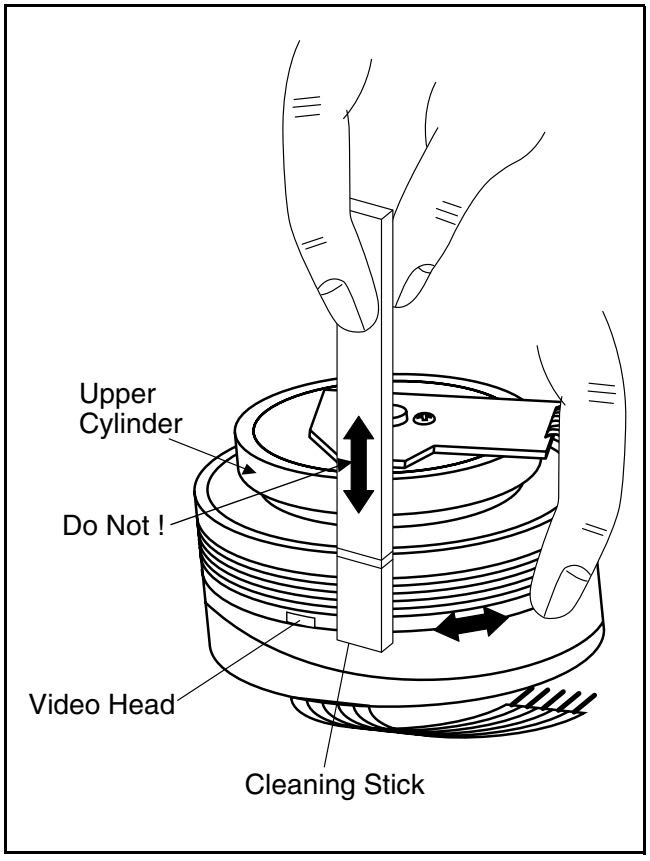
Clean the head with a head cleaning stick or chamois cloth.

**Procedure**

1. Remove the top cabinet.
2. Put on a glove (thin type) to avoid touching the upper and lower drum with your bare hand.
3. Put a few drops of 90% Isopropyl alcohol on the head cleaning stick or on the chamois cloth and, by slightly pressing it against the head tip, turn the upper drum to the right and to the left.

**Notes:**

1. The video head surface is made of very hard material, but since it is very thin, avoid cleaning it vertically.
2. Wait for the cleaned part to dry thoroughly before operating the unit.
3. Do not reuse a stained head cleaning stick or a stained chamois cloth.




### Cleaning of ACE Head

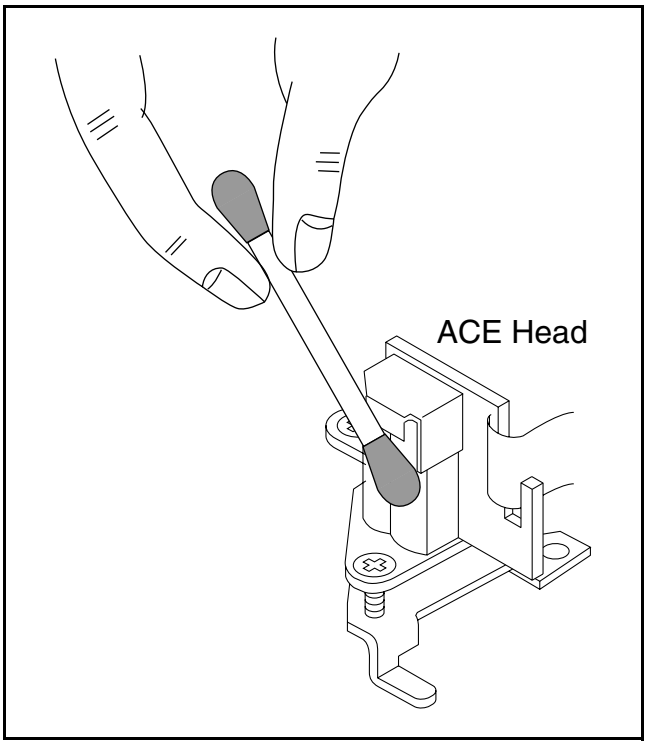
Clean the head with a cotton swab.

**Procedure**

1. Remove the top cabinet.
2. Dip the cotton swab in 90% Isopropyl alcohol and clean the ACE head. Be careful not to damage the upper drum and other tape running parts.

**Notes:**

1. Avoid cleaning the ACE head vertically.
2. Wait for the cleaned part to dry thoroughly before operating the unit or damage may occur.

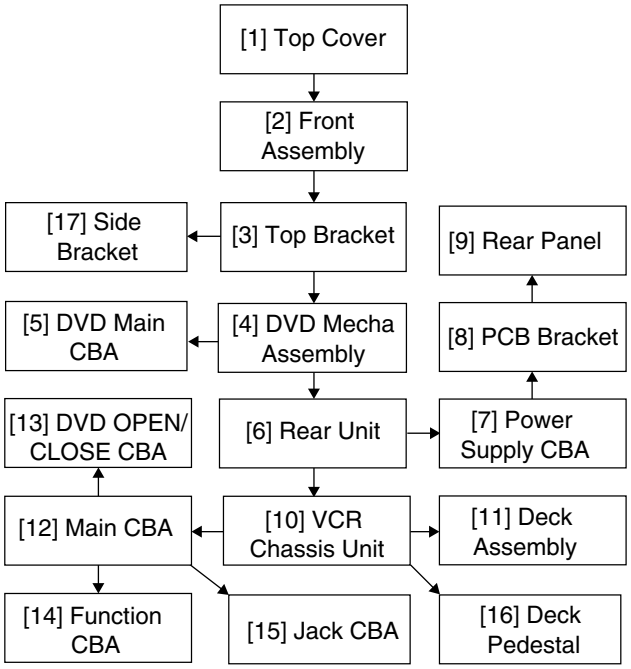


# 4 DISASSEMBLY

## 4-1 CABINET DISASSEMBLY INSTRUCTIONS

### 4-1-1 Disassembly Flowchart

This flowchart indicates the disassembly steps to gain access to item(s) to be serviced. When reassembling, follow the steps in reverse order. Bend, route, and dress the cables as they were originally.




### 4-1-2 Disassembly Method

| ID/ LOC. No. | PART | REMOVAL | | |
|---|---|---|---|---|
| | | Fig. No. | REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER | Note |
| [1] | Top Cover | 4-1-1 | 7(S-1) | - |
| [2] | Front Assembly | 4-1-2 | (S-2), *7(L-1) | 1<br>1-1<br>1-2 |
| [3] | Top Bracket | 4-1-2 | 2(S-3), 2(S-3A) | - |
| [4] | DVD Mecha Assembly | 4-1-3 | 3(S-4), *CN302, *CN401, *CN601 | - |
| [5] | DVD Main CBA | 4-1-4 | 2(S-5), *CN201, *CN301 | 2<br>2-1<br>2-2<br>2-3<br>3 |
| [6] | Rear Unit | 4-1-5 | 5(S-6), 4(S-7), CN003 | - |
| [7] | Power Supply CBA | 4-1-6 | 2(S-8), 2(S-8A) | - |
| [8] | PCB Bracket | 4-1-6 | 3(S-9) | - |
| [9] | Rear Panel | 4-1-6 | ---------- | - |
| [10] | VCR Chassis Unit | 4-1-7 | 5(S-10), 2(S-11), 2(S-11A) | - |
| [11] | Deck Assembly | 4-1-8 | Desolder, (S-12), (S-12A) | 4,5 |
| [12] | Main CBA | 4-1-8 | ---------- | - |
| [13] | DVD OPEN/ CLOSE CBA | 4-1-8 | Desolder | - |
| [14] | Function CBA | 4-1-8 | Desolder | - |
| [15] | Jack CBA | 4-1-8 | Desolder | - |
| [16] | Deck Pedestal | 4-1-9 | 7(S-13) | - |
| [17] | Side Bracket | 4-1-9 | (S-14) | - |
| | | ↓ (1) | ↓ (2) | ↓ (3) ↓ (4) ↓ (5) |

**Note:**

(1): Identification (location) No. of parts in the figures

(2): Name of the part

(3): Figure Number for reference

(4): Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
P=Spring, L=Locking Tab, S=Screw, CN=Connector
*=Unhook, Unlock, Release, Unplug, or Desolder
e.g. 2(S-2) = two Screws (S-2),
2(L-2) = two Locking Tabs (L-2)

(5): Refer to “Reference Notes.”

## Reference Notes

CAUTION 1: Locking Tabs (L-1) are fragile. Be careful not to break them.

1-1. Remove Screw (S-2).

1-2. Release seven Locking Tabs (L-1) (to do this, first release five Locking Tabs (A) at the side and top, and then release two Locking Tabs (B) at the bottom.)

CAUTION 2: Electrostatic breakdown of the laser diode in the optical system block may occur as a potential difference caused by electrostatic charge accumulated on cloth, human body etc., during unpacking or repair work.

To avoid damage of pickup follow next procedures.

2-1. Slide the pickup unit as shown in Fig. 4-1-4.

2-2. Short the three short lands of FPC cable with solder before removing the FFC cable (CN301) from it. If you disconnect the FFC cable (CN301), the laser diode of pickup will be destroyed. (Fig. 4-1-4)

2-3. Disconnect Connector (CN201). Remove two Screws (S-5) and lift the DVD Main CBA. (Fig. 4-1-4)

CAUTION 3: When reassembling, confirm the FFC cable (CN301) is connected completely. Then remove the solder from the three short lands of FPC cable. (Fig. 4-1-4)

CAUTION 4: When reassembling, solder wire jumpers as shown in Fig. 4-1-8.

CAUTION 5: Before installing the Deck Assembly, be sure to place the pin of LD-SW on Main CBA as shown in Fig. 4-1-8. Then, install the Deck Assembly while aligning the hole of Cam Gear with the pin of LD-SW, the shaft of Cam Gear with the hole of LD-SW as shown in Fig. 4-1-8.

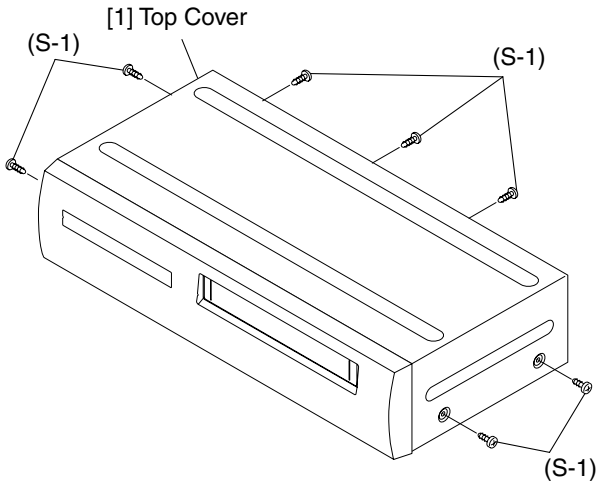


Fig. 4-1-1

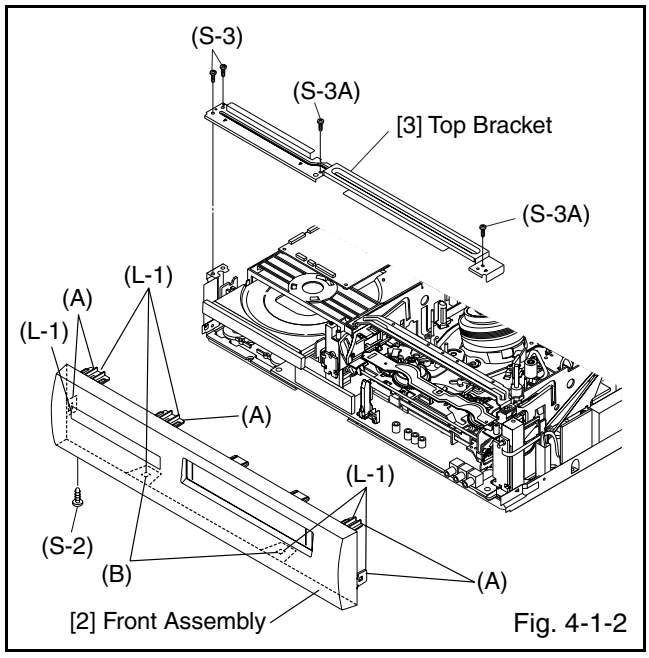


Fig. 4-1-2

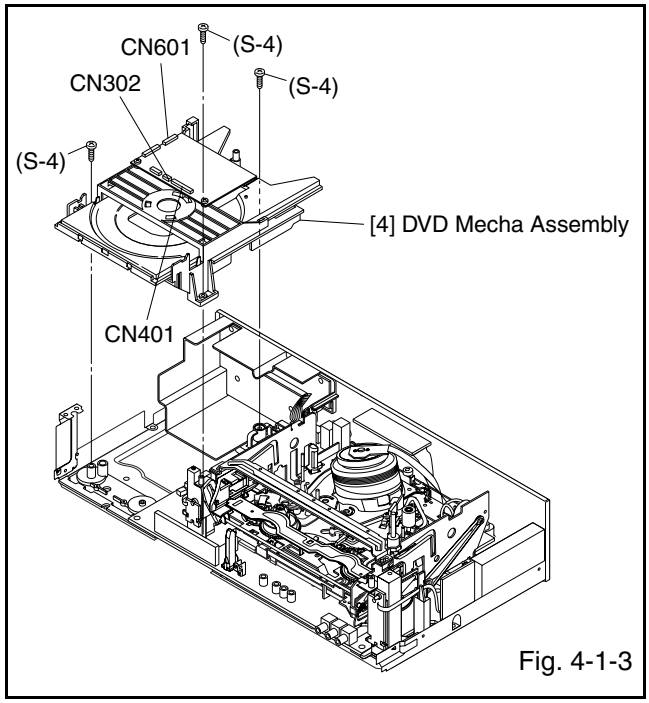


Fig. 4-1-3

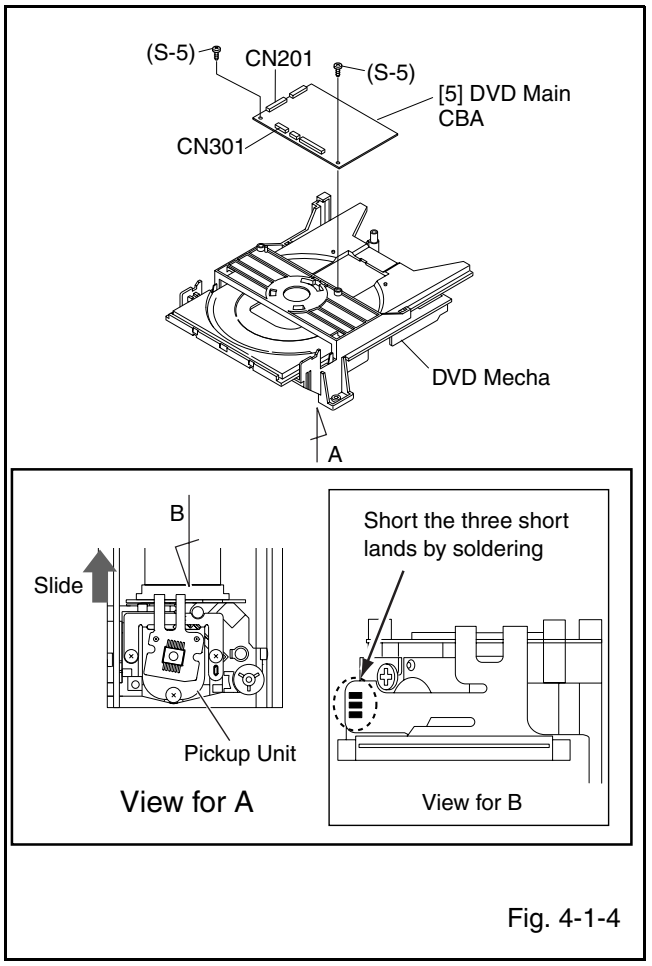



Fig. 4-1-4

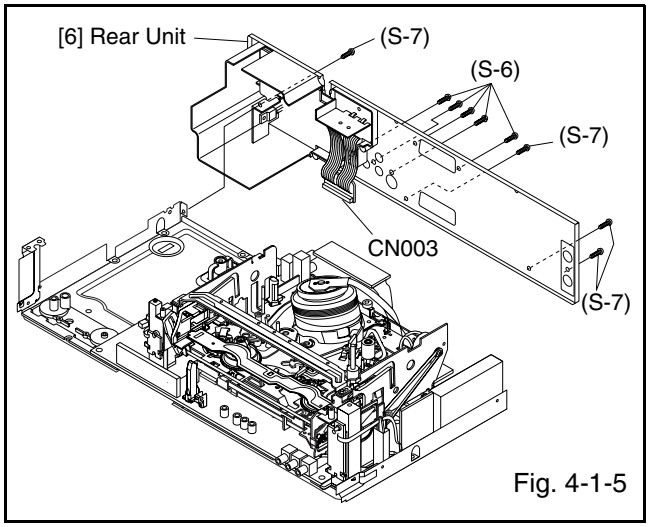



Fig. 4-1-5

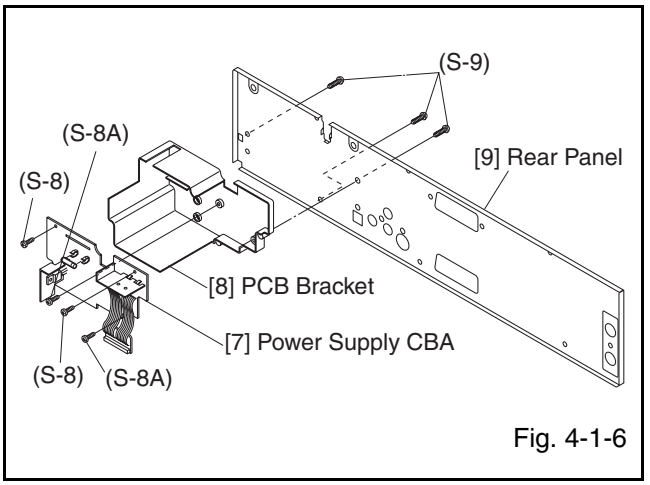



Fig. 4-1-6

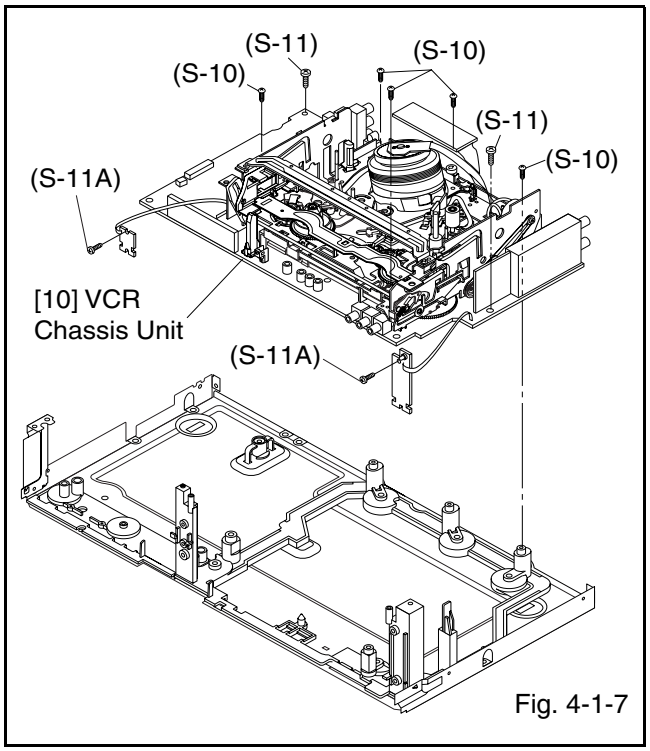
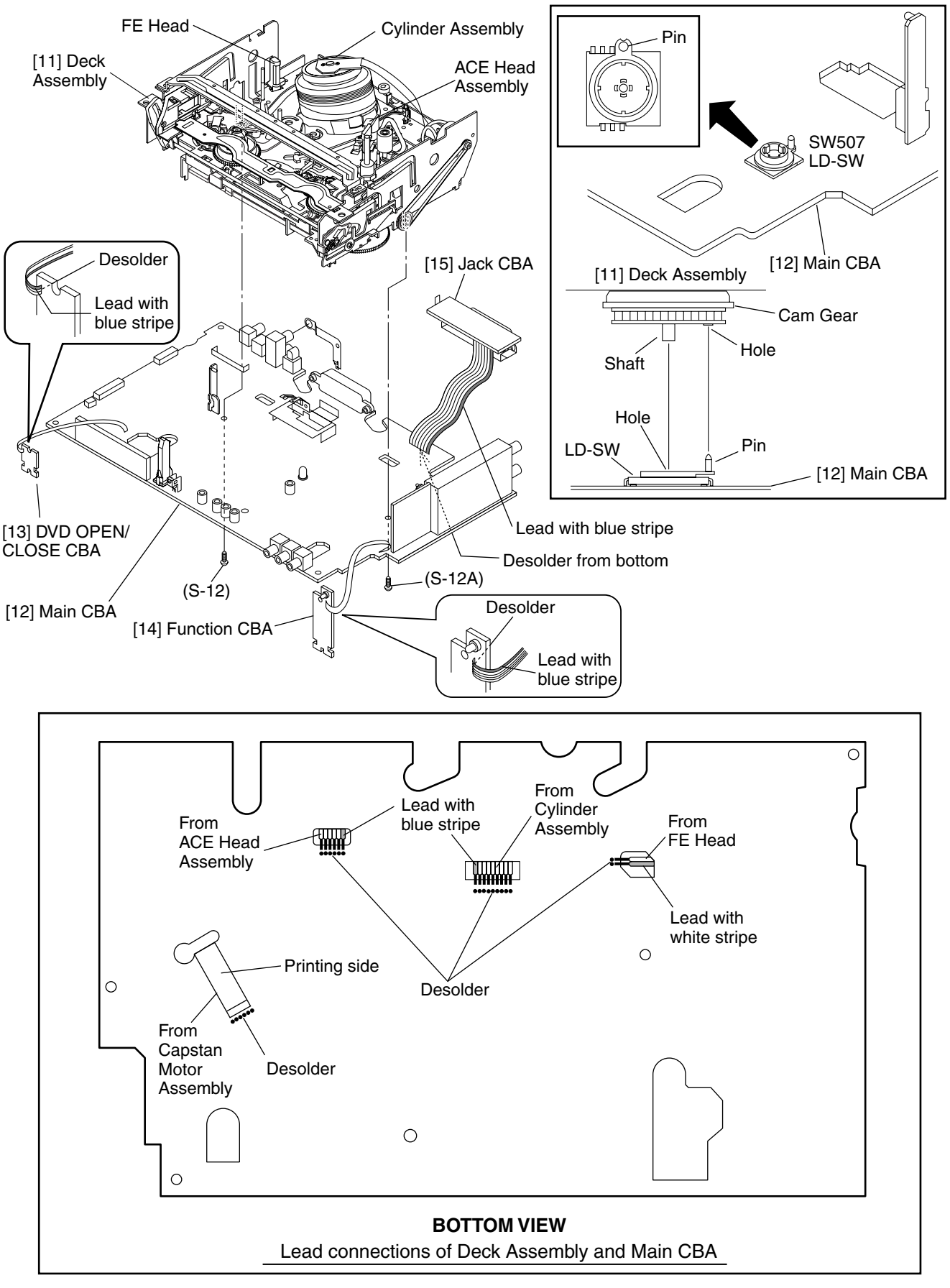



Fig. 4-1-7




**BOTTOM VIEW**

Lead connections of Deck Assembly and Main CBA

Fig. 4-1-8

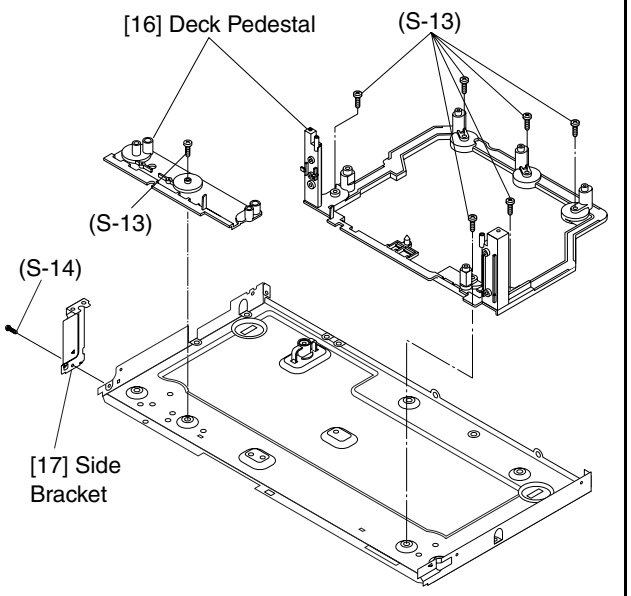
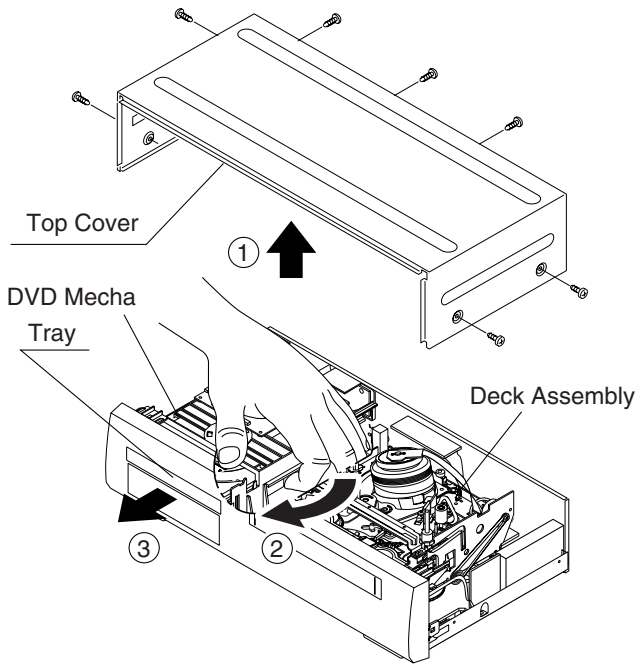
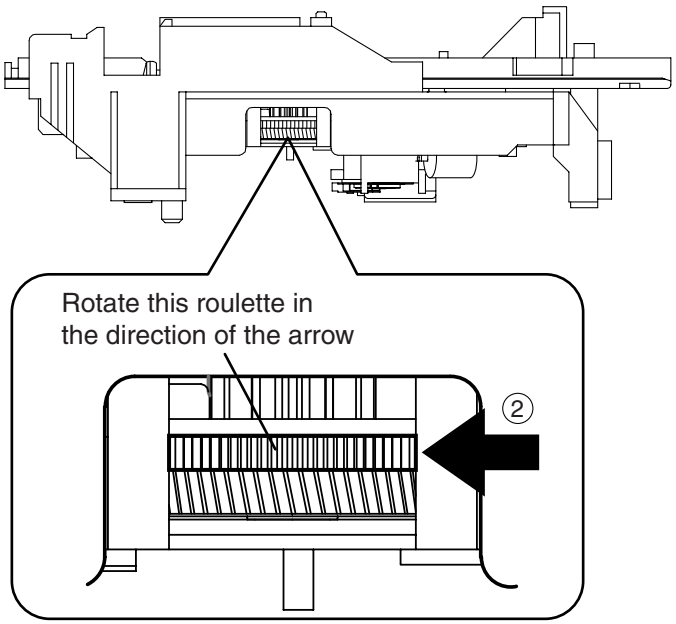



Fig. 4-1-9

## To Remove the Disc Manually

1. Remove the Top Cover.
2. Rotate this roulette in the direction of the arrow as shown below.



# 4-2 DISASSEMBLY/ASSEMBLY PROCEDURES OF DECK MECHANISM

Before following the procedures described below, be sure to remove the deck assembly from the cabinet. (Refer to CABINET DISASSEMBLY INSTRUCTIONS on page 4-1.)
All the following procedures, including those for adjustment and replacement of parts, should be done in Eject mode; see the positions of [44] and [45] in Fig. 4-2-1 on page 4-8. When reassembling, follow the steps in reverse order.

| STEP /LOC. No. | START-ING No. | PART | | REMOVAL | | INSTALLATION |
|---|---|---|---|---|---|---|
| | | | | Fig. No. | REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER | ADJUSTMENT CONDITION |
| [1] | [1] | Guide Holder A | T | 4-2-3 | 2(S-1) | |
| [2] | [1] | Cassette Holder Assembly | T | 4-2-4 | | |
| [3] | [2] | Slider (SP) | T | 4-2-5 | *(L-1) | |
| [4] | [2] | Slider (TU) | T | 4-2-5 | *(L-2) | |
| [5] | [4] | Lock Lever | T | 4-2-5 | *(L-3),*(P-1) | |
| [6] | [2] | Cassette Plate | T | 4-2-5 | | |
| [7] | [7] | Cylinder Assembly | T | 4-2-1,4-2-6 | Desolder, 3(S-2) | |
| [8] | [8] | Loading Motor Assembly | T | 4-2-1,4-2-7 | Desolder, LDG Belt, 2(S-3) | |
| [9] | [9] | AC Head Assembly | T | 4-2-1,4-2-7 | (S-4) | |
| [10] | [2] | Tape Guide Arm Assembly | T | 4-2-1,4-2-8 | *(P-2) | |
| [11] | [10] | C Door Opener | T | 4-2-1,4-2-8 | *(L-4) | |
| [12] | [11] | Pinch Arm (B) | T | 4-2-1,4-2-8 | *(P-3) | |
| [13] | [12] | Pinch Arm Assembly | T | 4-2-1,4-2-8 | | |
| [14] | [14] | FE Head Assembly | T | 4-2-1,4-2-9 | (S-5) | |
| [15] | [15] | Prism | T | 4-2-1,4-2-9 | (S-6) | |
| [16] | [2] | Slider Shaft | T | 4-2-10 | *(L-5) | |
| [17] | [16] | C Drive Lever (SP) | T | 4-2-10 | | |
| [18] | [16] | C Drive Lever (TU) | T | 4-2-10 | (S-7),*(P-4) | |
| [19] | [19] | Capstan Motor | B | 4-2-2,4-2-11 | 3(S-8), Cap Belt | |
| [20] | [20] | Clutch Assembly (HI) | B | 4-2-2,4-2-12 | (C-1) | |
| [21] | [20] | Center Gear | B | 4-2-12 | | |
| [22] | [22] | F Brake Assembly (HI) | B | 4-2-2,4-2-12 | *(L-6) | |
| [23] | [22] | Worm Holder | B | 4-2-2,4-2-13 | (S-9),*(L-7),*(L-8) | |
| [24] | [22] | Pulley Assembly (HI) | B | 4-2-2,4-2-13 | | |
| [25] | [25] | Mode Gear | B | 4-2-2,4-2-13 | (C-2) | |
| [26] | [20],[25] | Mode Lever (HI) | B | 4-2-2,4-2-13 | (C-3) | |
| [27] | [22],[23], [26] | Cam Gear (A) (HI) | B | 4-2-2,4-2-13 | (C-4) | (+)Refer to Alignment Sec.Page 4-13 |
| [28] | [26] | TR Gear C | B | 4-2-2,4-2-13 | (C-5) | |
| [29] | [28] | TR Gear Spring | B | 4-2-13 | | |
| [30] | [29] | TR Gear A/B | B | 4-2-13 | | |
| [31] | [31] | FF Arm (HI) | B | 4-2-1,4-2-13 | | |
| [32] | [26] | Idler Assembly (HI) | B | 4-2-1,4-2-14 | *(L-9) | |
| [33] | [26] | BT Arm | B | 4-2-2,4-2-14 | *(P-5) | |

| STEP /LOC. No. | START-ING No. | PART | | REMOVAL | | INSTALLATION |
|---|---|---|---|---|---|---|
| | | | | Fig. No. | REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER | ADJUSTMENT CONDITION |
| [34] | [26] | Loading Arm (SP) Assembly | B | 4-2-2,4-2-14 | | (+)Refer to Alignment Sec.Page 4-13 |
| [35] | [34] | Loading Arm (TU) Assembly | B | 4-2-2,4-2-14 | | (+)Refer to Alignment Sec.Page 4-13 |
| [36] | [16],[26] | M Brake (TU) Assembly (HI) | T | 4-2-1,4-2-15 | | |
| [37] | [2],[26] | M Brake (SP) Assembly (HI) | T | 4-2-1,4-2-15 | *(P-6) | |
| [38] | [37] | Tension Lever Assembly | T | 4-2-1,4-2-15 | | |
| [39] | [38] | T Lever Holder | T | 4-2-15 | *(L-10) | |
| [40] | [40] | M Gear (HI) | T | 4-2-1,4-2-15 | (C-6) | |
| [41] | [15],[40] | Sensor Gear (HI) | T | 4-2-1,4-2-15 | (C-7) | |
| [42] | [36],[40] | Reel T | T | 4-2-1,4-2-15 | | |
| [43] | [38] | Reel S | T | 4-2-1,4-2-15 | | |
| [44] | [34],[38] | Moving Guide S Preparation | T | 4-2-1,4-2-16 | | |
| [45] | [35] | Moving Guide T Preparation | T | 4-2-1,4-2-16 | | |
| [46] | [19] | TG Post Assembly | T | 4-2-1,4-2-16 | *(L-11) | |
| [47] | [27] | Rack Assembly | R | 4-2-17 | | (+)Refer to Alignment Sec.Page 4-13 |
| [48] | [47] | F Door Opener | R | 4-2-17 | | |
| [49] | [49] | Cleaner Assembly | T | 4-2-1,4-2-6 | | |
| [50] | [49] | CL Post | T | 4-2-6 | *(L-12) | |
| ↓ (1) | ↓ (2) | ↓ (3) | ↓ (4) | ↓ (5) | ↓ (6) | ↓ (7) |

(1): Follow steps in sequence. When reassembling, follow the steps in reverse order.
These numbers are also used as identification (location) No. of parts in the figures.

(2): Indicates the part to start disassembling with in order to disassemble the part in column (1).

(3): Name of the part

(4): Location of the part: T=Top B=Bottom R=Right L=Left

(5): Figure Number

(6): Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.
P=Spring, W=Washer, C=Cut Washer, S=Screw, *=Unhook, Unlock, Release, Unplug, or Desolder
e.g., 2(L-2) = two Locking Tabs (L-2).

(7): Adjustment Information for Installation
(+):Refer to Deck Exploded Views for lubrication.

.

## Top View

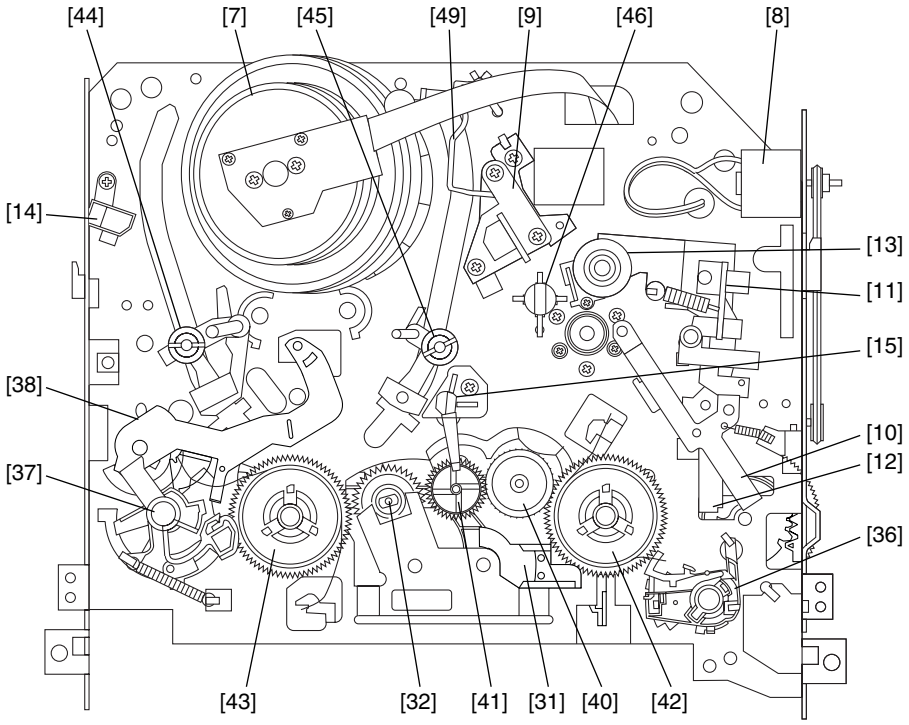



**Fig. 4-2-1**

## Bottom View

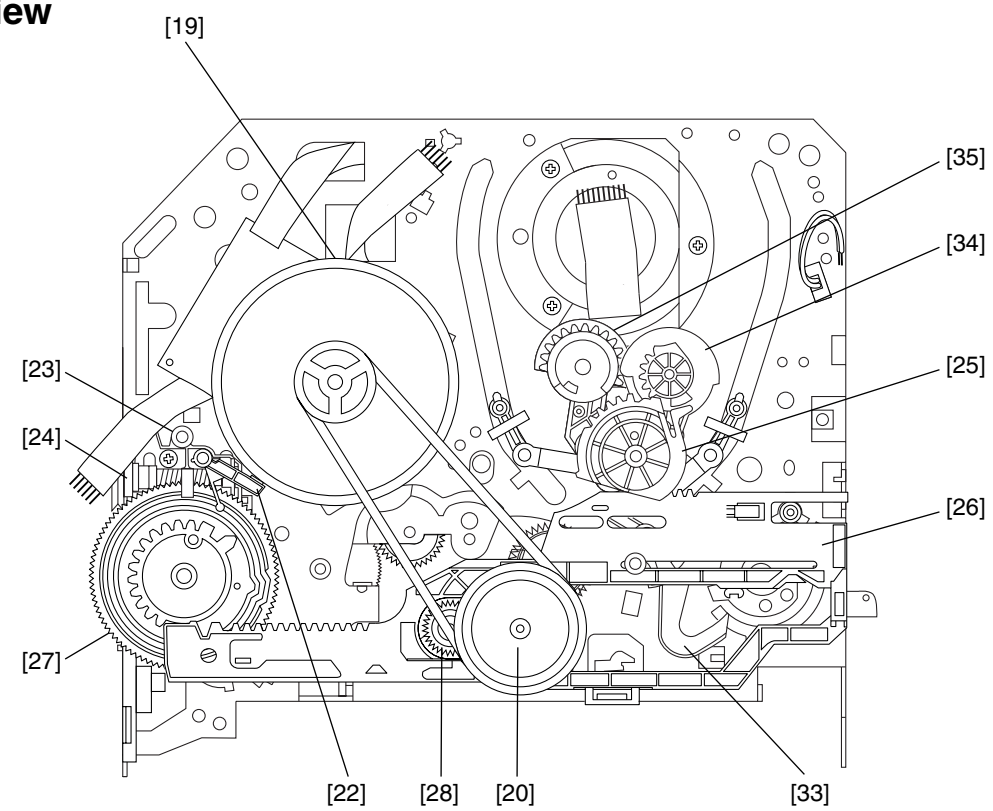



**Fig. 4-2-2**

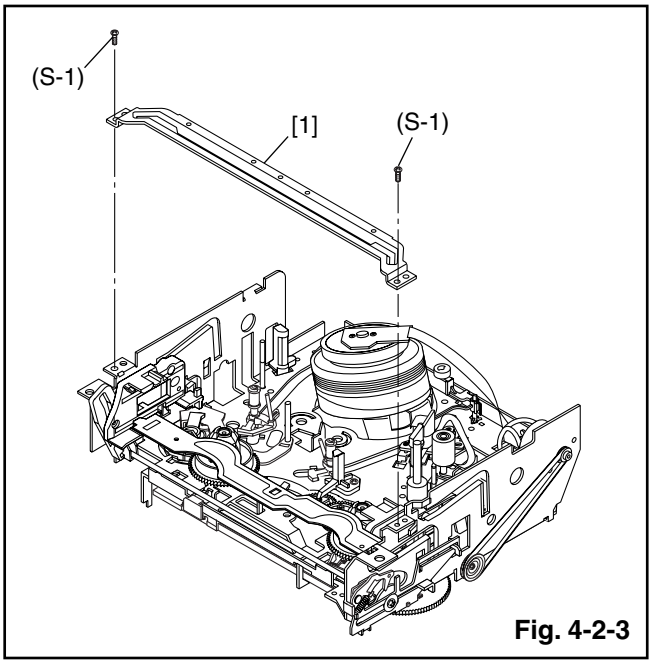



**Fig. 4-2-3**

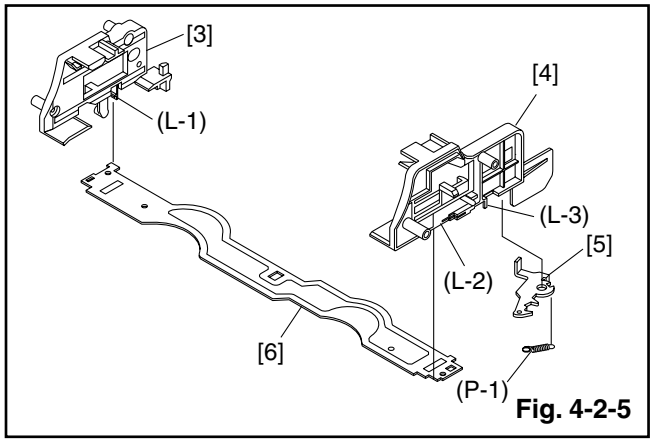
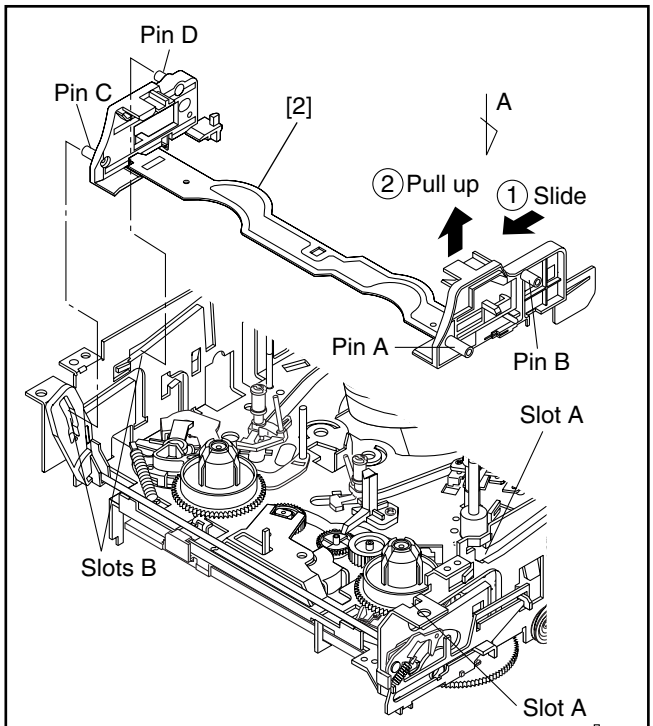



**Fig. 4-2-5**




First, while pushing the locking tab as shown in the right, slide and pull up the right side on [2] to release Pin A and Pin B from the slots A.
Then, remove Pin C and Pin D on [2] from the slots B as shown.

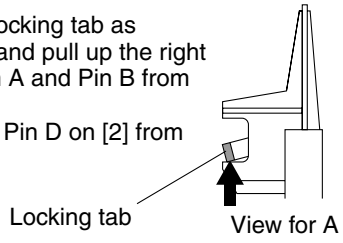
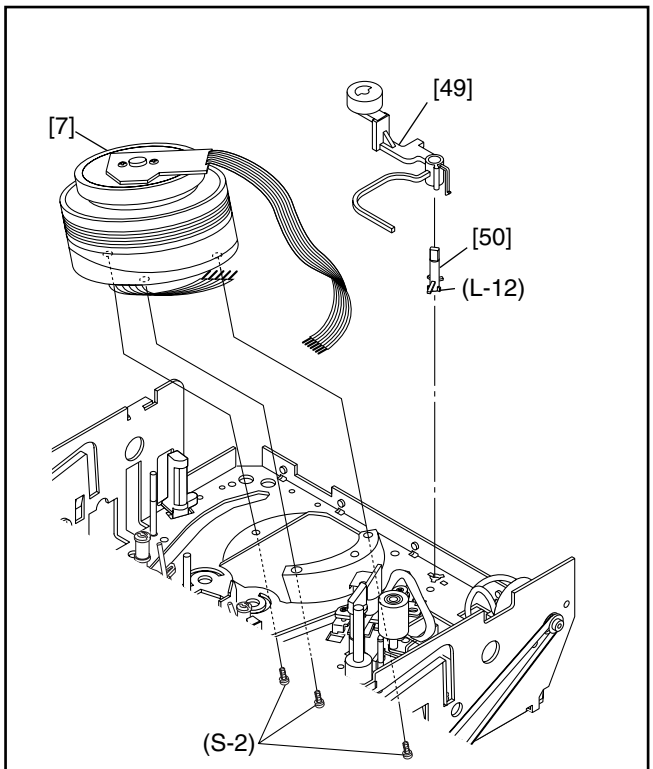



**Fig. 4-2-4**



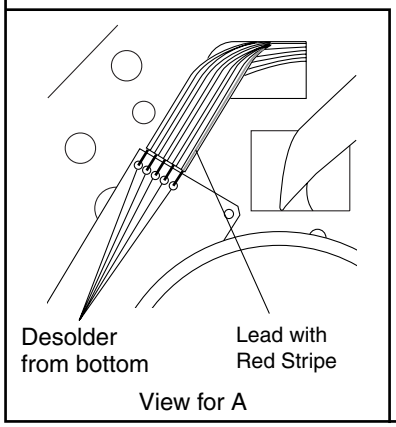





**Fig. 4-2-6**

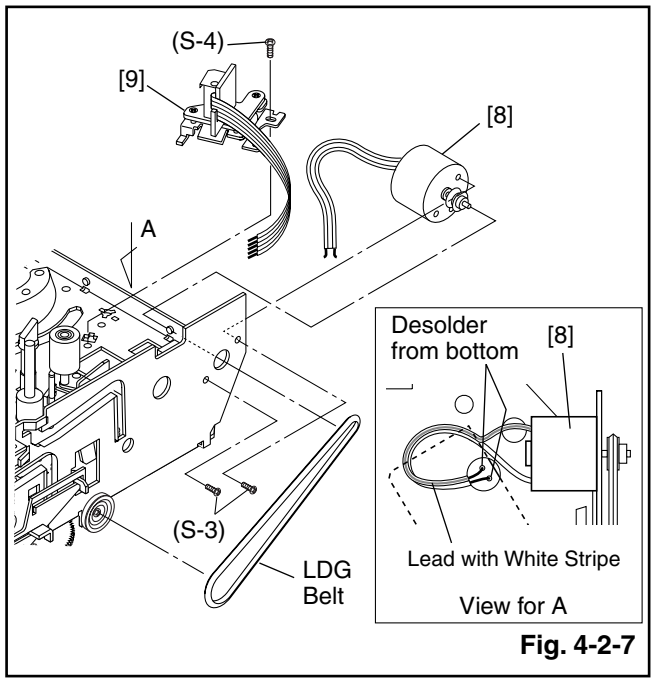



**Fig. 4-2-7**

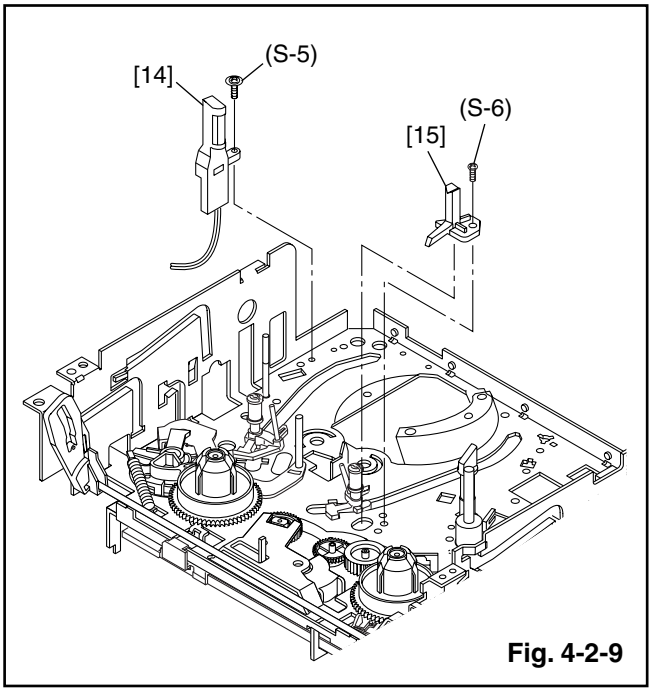



**Fig. 4-2-9**

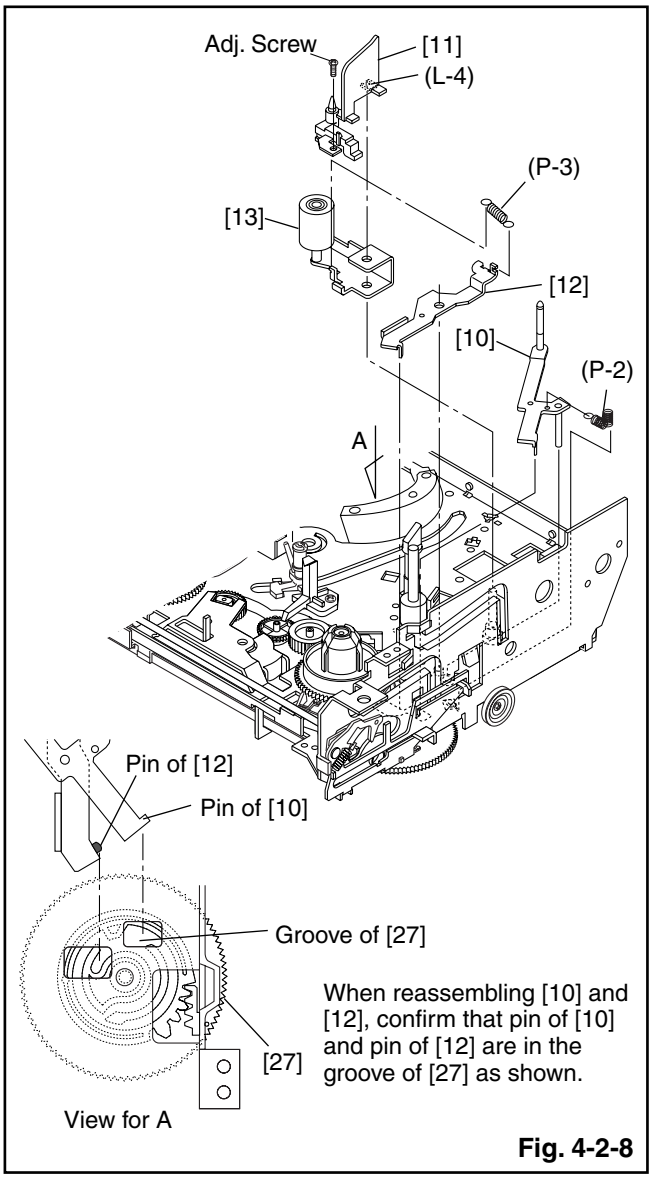



**Fig. 4-2-8**

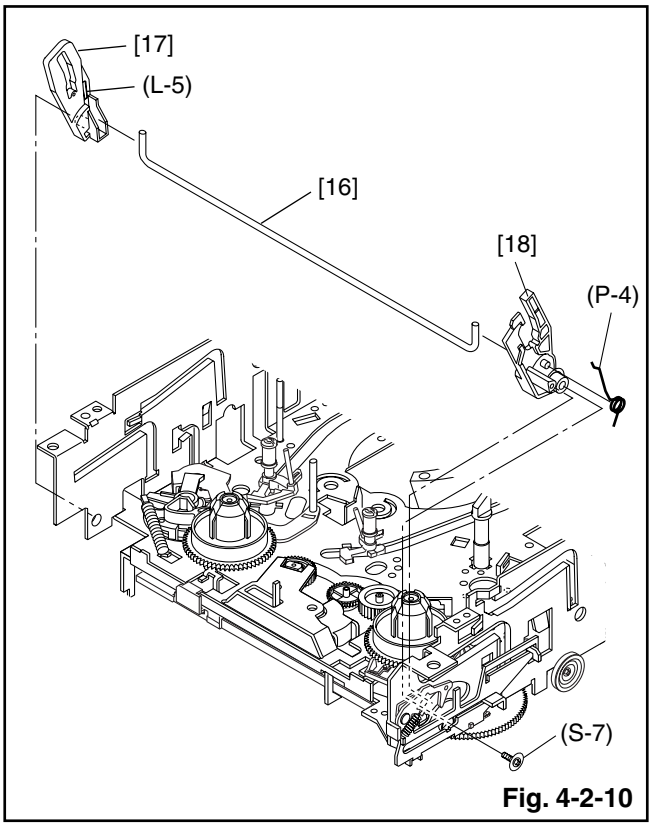



**Fig. 4-2-10**

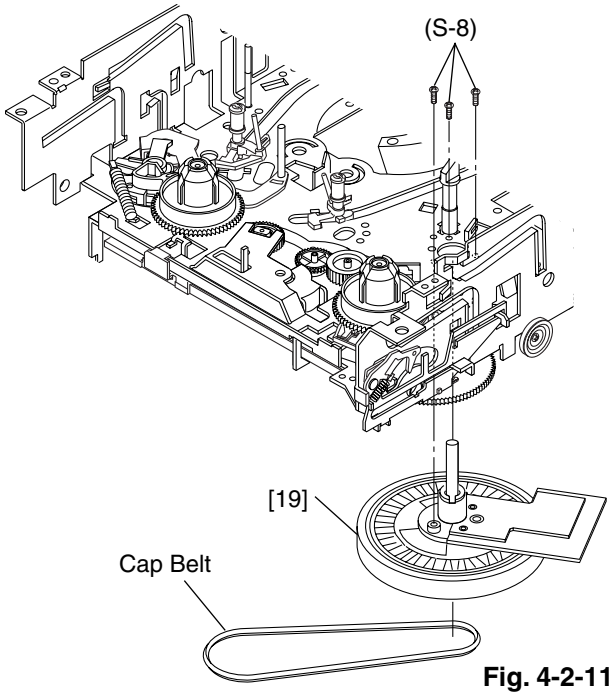
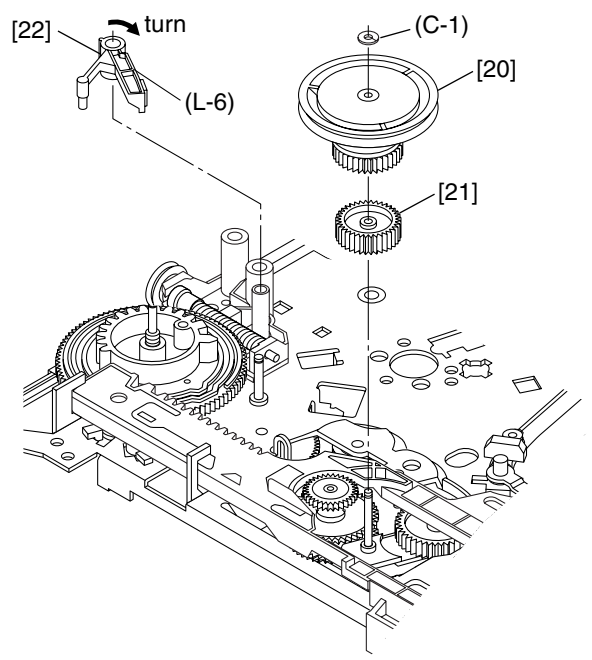



**Fig. 4-2-11**



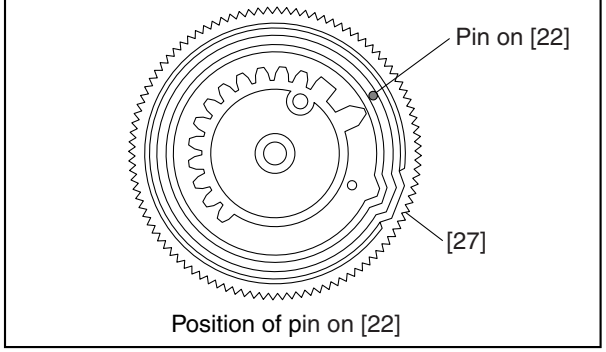
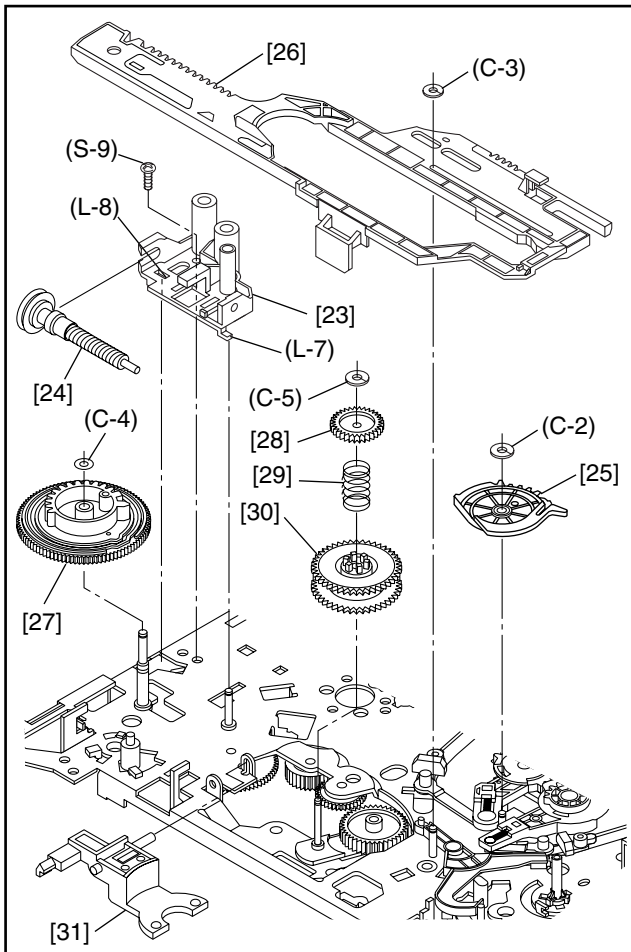
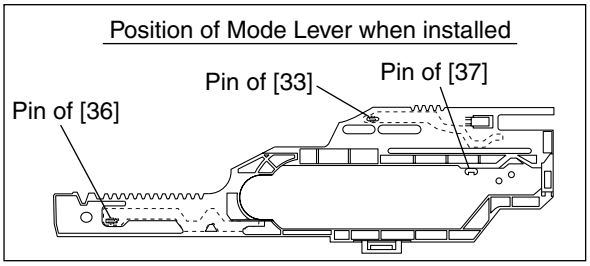
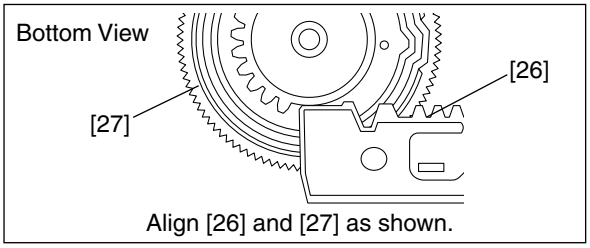




**Fig. 4-2-12**



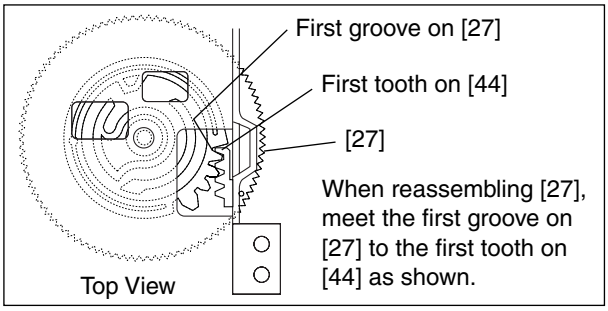




**Fig. 4-2-13**

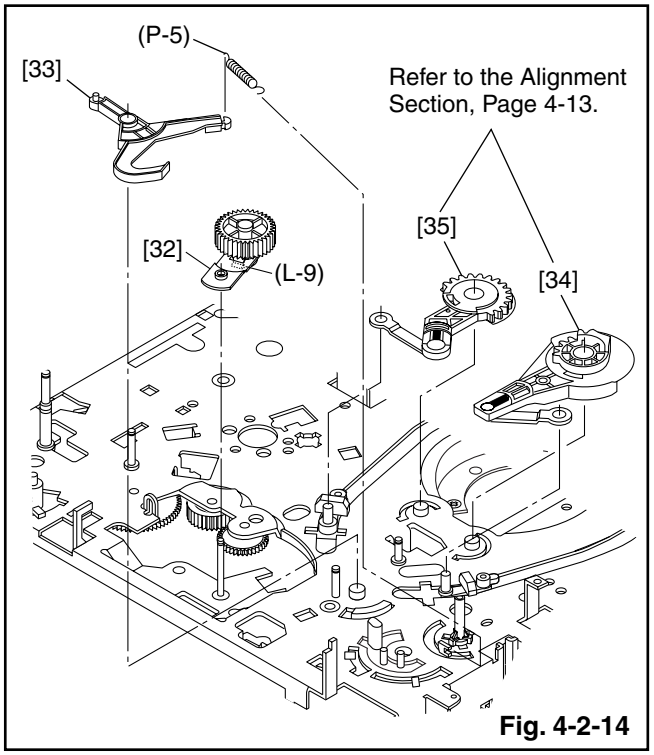



**Fig. 4-2-14**

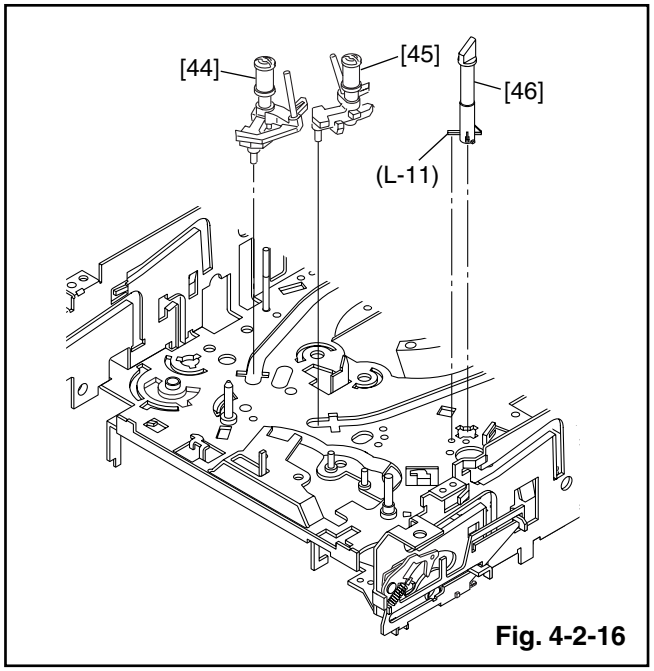



**Fig. 4-2-16**

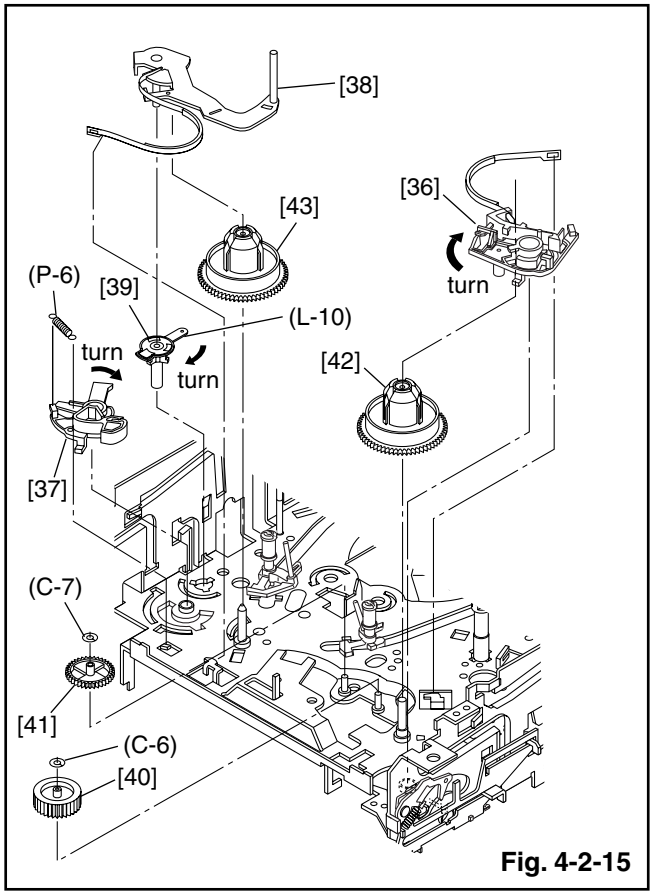



**Fig. 4-2-15**

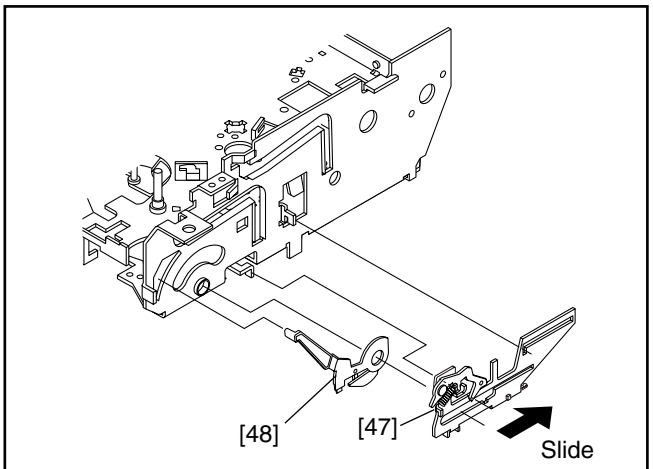



**Fig. 4-2-17**

# 4-3 ALIGNMENT PROCEDURES OF MECHANISM

The following procedures describe how to align the individual gears and levers that make up the tape loading/unloading mechanism. Since information about the state of the mechanism is provided to the System Control Circuit only through the Mode Switch, it is essential that the correct relationship between individual gears and levers be maintained.

**All alignments are to be performed with the mechanism in Eject mode,** in the sequence given. Each procedure assumes that all previous procedures have been completed.

**IMPORTANT:**

If any one of these alignments is not performed properly, even if off by only one tooth, the unit will unload or stop and it may result in damage to the mechanical or electrical parts.

## Alignment points in Eject Position

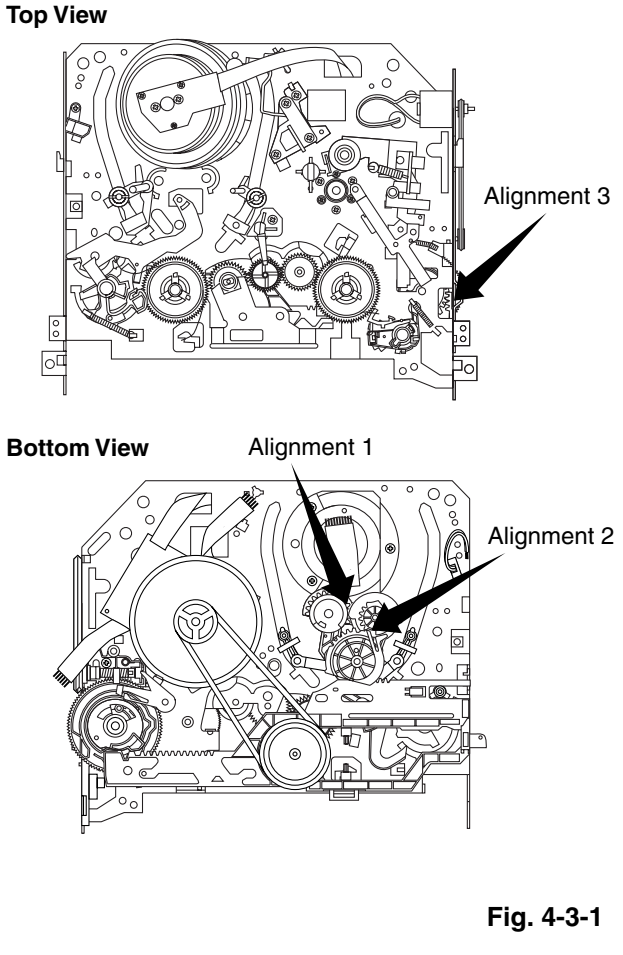



**Fig. 4-3-1**

Alignment 1

## Loading Arm (SP) and (TU) Assembly

Install Loading Arm (SP) and (TU) Assembly so that their triangle marks point to each other as shown in Fig. 4-3-2.

Alignment 2

## Mode Gear

Keeping the two triangles pointing at each other, install the Loading Arm (TU) Assembly so that the last tooth of the gear meets the most inside teeth of the Mode Gear. See Fig. 4-3-2.

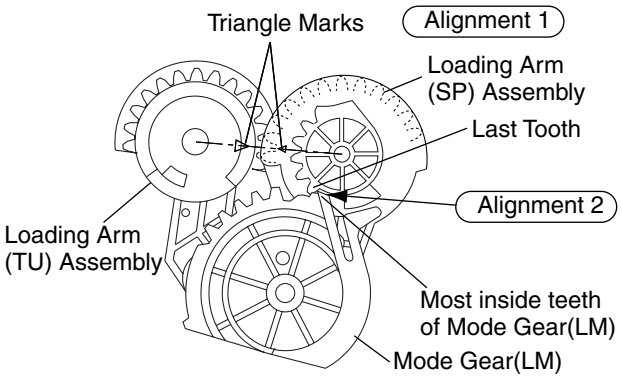



**Fig. 4-3-2**

Alignment 3

## Cam Gear (A)(HI), Rack Assembly

Install the Rack Assembly so that the first tooth on the gear of the Rack Assembly meets the first groove on the Cam Gear (A)(HI) as shown in Fig. 4-3-3.

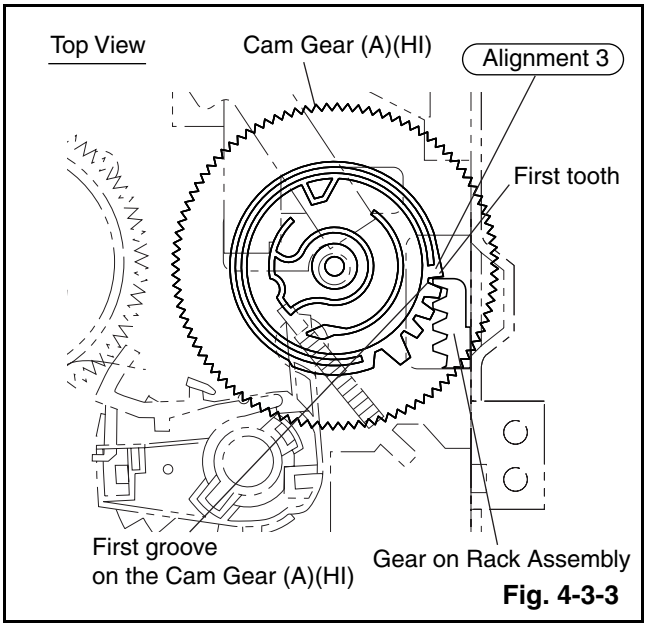



**Fig. 4-3-3**

# 5 ADJUSTMENT

# 5-1 PREPARATION FOR SERVICING

## 5-1-1 How to Enter the Service Mode

About Optical Sensors

**Caution:**

An optical sensor system is used for the Tape Start and End Sensors on this equipment. Carefully read and follow the instructions below. Otherwise the unit may operate erratically.

**What to do for preparation**

Insert a tape into the Deck Mechanism Assembly and press the PLAY button. The tape will be loaded into the Deck Mechanism Assembly. Make sure the power is on, connect TP501 (SENSOR INHIBITION) to GND. This will stop the function of Tape Start Sensor, Tape End Sensor and Reel Sensors. (If these TPs are connected before plugging in the unit, the function of the sensors will stay valid.) See Fig. 5-1-1.

**Note:** Because the Tape End Sensors are inactive, do not run a tape all the way to the start or the end of the tape to avoid tape damage.

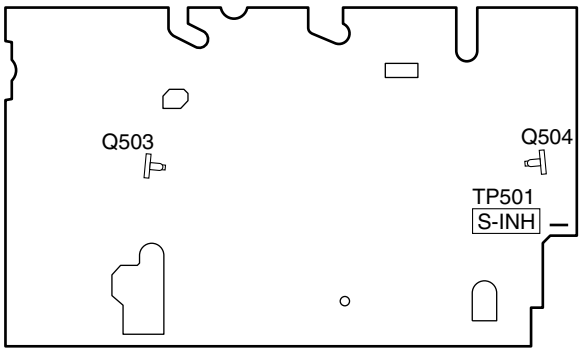
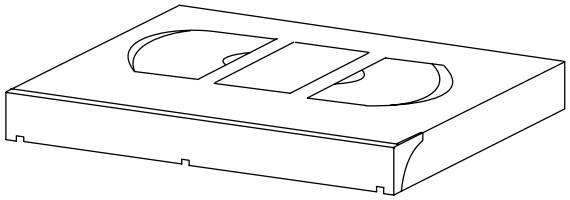



**Fig. 5-1-1**

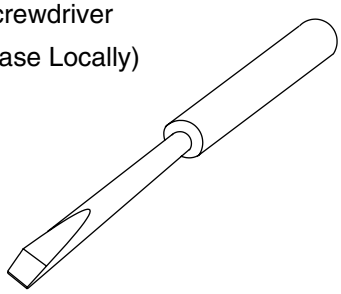
# 5-2 FIXTURE AND TAPE FOR ADJUSTMENT

1. Alignment Tape
   No. 7099052 (MH-2)



2. Guide Roller Adj. Screwdriver
   No. 7099028

3. Flat Screwdriver
   (Purchase Locally)



## 5-2-1 How To Use The Fixtures And Tape

| Item No. | Name | Part No. | Adjustment |
|---|---|---|---|
| 1 | Alignment Tape | 7099052 | ● Head Switching Point<br>● Tape Interchangeability Alignment |
| 2 | Guide Roller Adj. Screwdriver | 7099028 | ● Guide Roller |
| 3 | Flat Screwdriver | Purchase Locally | ● X Value Alignment |

# 5-3 ELECTRICAL ADJUSTMENT INSTRUCTIONS

**General Note: "CBA" is an abbreviation for "Circuit Board Assembly."**

**NOTE:**

1. Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to do these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.
2. To perform these alignment / confirmation procedures, make sure that the tracking control is set in the center position: Press either "CHANNEL ▼" or "CHANNEL ▲" button on the front panel first, then the "PLAY" button on the front panel.

## 5-3-1 Test Equipment Required

1. Oscilloscope: Dual-trace with 10:1 probe,
   V-Range: 0.001~50V/Div.,
   F-Range: DC~AC-20MHz
2. Alignment Tape (MH-2)

## 5-3-2 Head Switching Position Adjustment

**Purpose:**

To determine the Head Switching point during playback.

**Symptom of Misadjustment:**

May cause Head Switching noise or vertical jitter in the picture.

| Test point | Adj.Point | Mode | Input |
|---|---|---|---|
| TP751(V-OUT)<br>TP504(RF-SW)<br>GND | VR501<br>(Switching Point)<br>(MAIN CBA) | PLAY<br>(SP) | ----- |
| **Tape** | **Measurement Equipment** | **Spec.** | |
| MH-2 | Oscilloscope | 6.5H±1H<br>(412.7μs±60μs) | |

**Connections of Measurement Equipment**

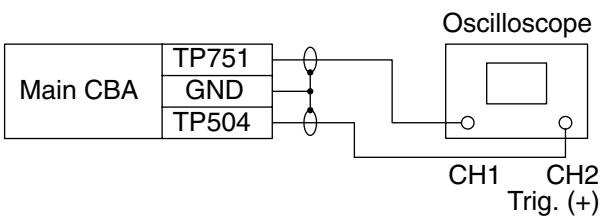
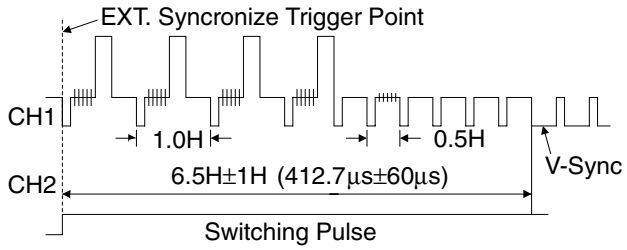



**Figure 1**




**Reference Notes:**

Playback the Alignment tape and adjust VR501 so that the V-sync front edge of the CH1 video output waveform is at the 6.5H±1H(412.7μs±60μs) delayed position from the rising edge of the CH2 head switching pulse waveform.

# 5-4 MECHANICAL ALIGNMENT PROCEDURES

Explanation of alignment for the tape to correctly run starts on the next page. Refer to the information below on this page if a tape gets stuck, for example, in the mechanism due to some electrical trouble of the unit.

## 5-4-1 Service Information

**A.** Method for Manual Tape Loading/Unloading

To load a cassette tape manually:

1. Disconnect the AC plug.
2. Remove the Top Case and Front Assembly.
3. Insert a cassette tape. Though the tape will not be automatically loaded, make sure that the cassette tape is all the way in at the inlet of the Cassette Holder. To confirm this, lightly push the cassette tape further in and see if the tape comes back out, by a spring motion, just as much as you have pushed in.
4. Turn the LDG Belt in the appropriate direction shown in Fig. 5-4-1 for a minute or two to complete this task.

To unload a cassette tape manually:

1. Disconnect the AC plug.
2. Remove the Top Case and Front Assembly.
3. Make sure that the Moving guide preparations are in the Eject Position.
4. Turn the LDG Belt in the appropriate direction shown in Fig. 5-4-1 until the Moving guide preparations come to the Eject Position. Stop turning when the preparations begin clicking or can not be moved further. However, the tape will be left wound around the cylinder.
5. Turn the LDG Belt in the appropriate direction continuously, and the cassette tape will be ejected. Allow a minute or two to complete this task.

**B.** Method to place the Cassette Holder in the tape-loaded position without a cassette tape

1. Disconnect the AC Plug.
2. Remove the Top Case and Front Assembly.
3. Turn the LDG Belt in the appropriate direction shown in Fig. 5-4-1. Release the locking tabs shown in Fig. 5-4-1 and continue turning the LDG Belt until the Cassette Holder comes to the tape-loaded position. Allow a minute or two to complete this task.

**Top View**

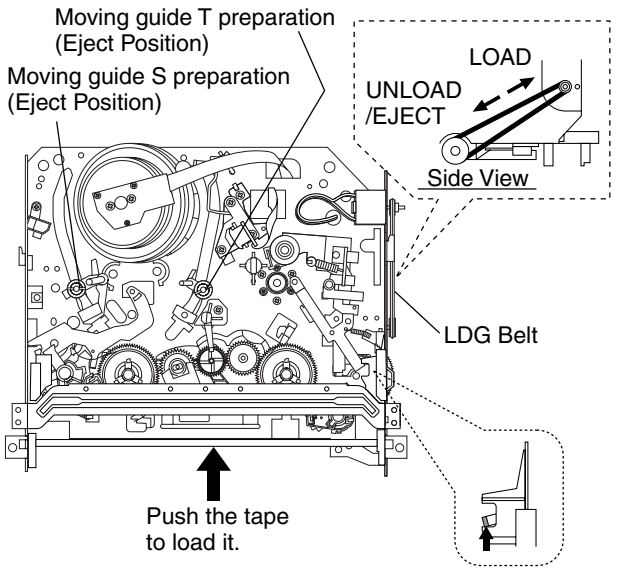



**Fig. 5-4-1**

**Bottom View**

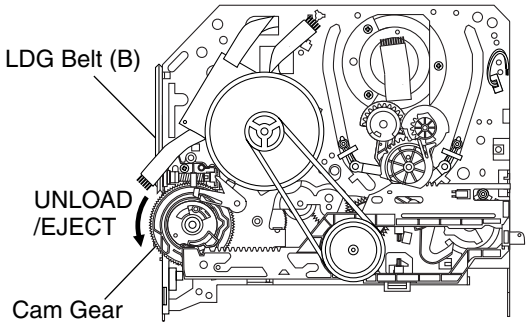



**Fig. 5-4-2**

## 5-4-2 Tape Interchangeability Alignment

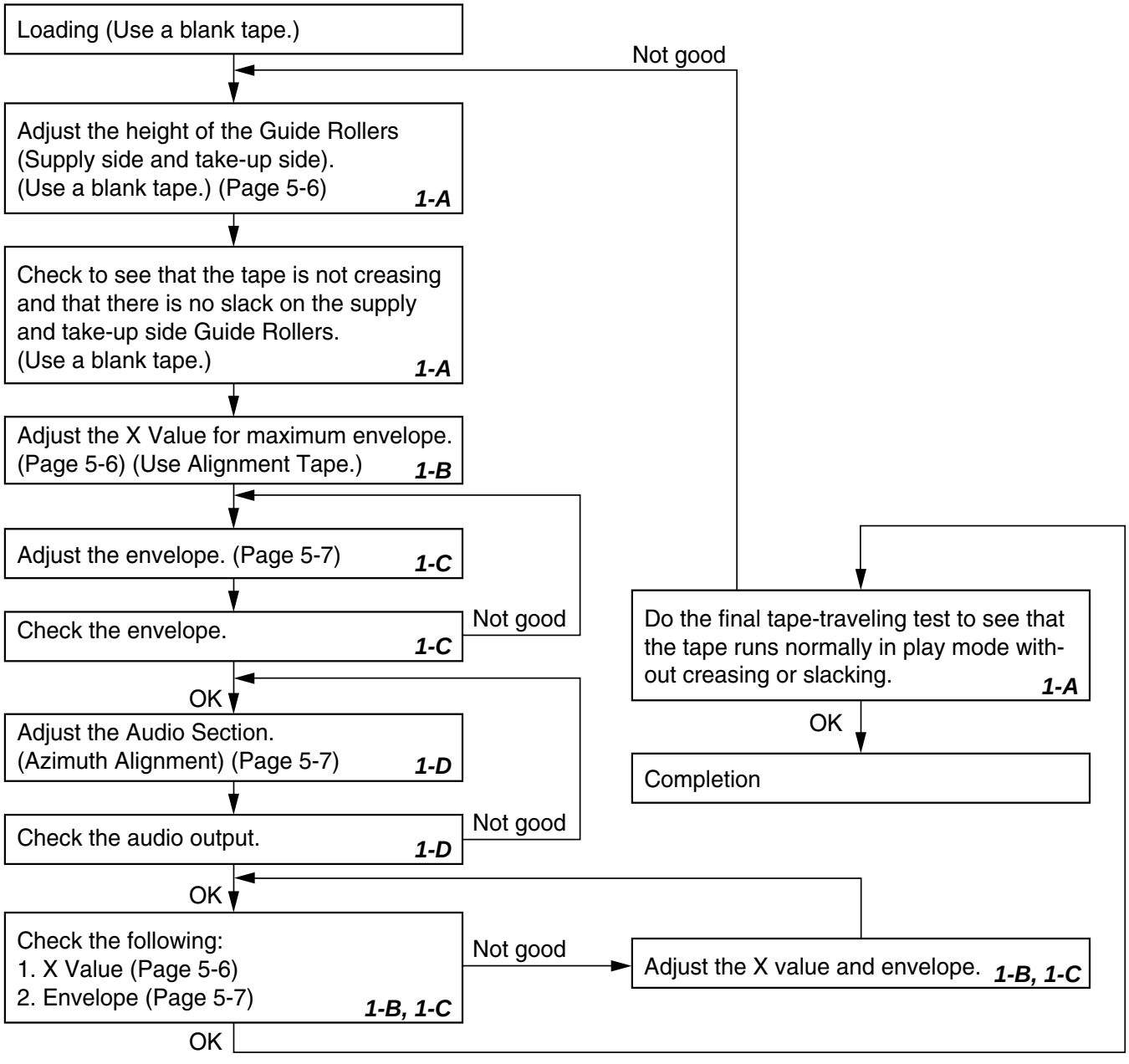
Note:
To do these alignment procedures, make sure that the Tracking Control Circuit is set to the center position every time a tape is loaded or unloaded. (Refer to page 5-7, procedure 1-C, step 2.)

**Equipment required:**

Dual Trace Oscilloscope
VHS Alignment Tape (MH-2)
Guide Roller Adj. Screwdriver
Flat Screwdriver (Purchase Locally)

Note: Before starting this Mechanical Alignment, do all Electrical Adjustment procedures.

**Flowchart of Alignment for tape traveling**



## 1-A. Preliminary/Final Checking and Alignment of Tape Path

**Purpose:**

To make sure that the tape path is well stabilized.

**Symptom of Misalignment:**

If the tape path is unstable, the tape will be damaged.

**Note:** Do not use an Alignment Tape for this procedure. If the unit is not correctly aligned, the tape may be damaged.

1. Playback a blank cassette tape and check to see that the tape runs without creasing at Guide Rollers [2] and [3], and at points A and B on the lead surface. (Refer to Fig. 5-4-3 and 5-4-4.)
2. If creasing is apparent, align the height of the guide rollers by turning the top of Guide Rollers [2] and [3] with a Guide Roller Adj. Screwdriver. (Refer to Fig. 5-4-3 and 5-4-5.)

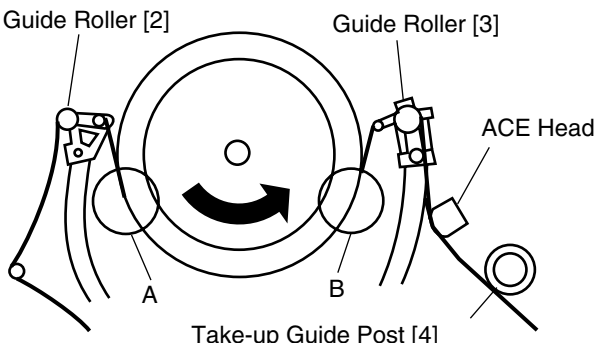


**Fig. 5-4-3**

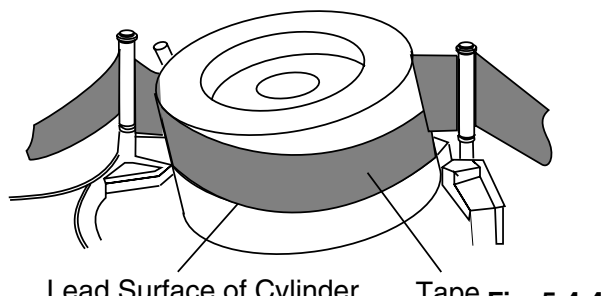


**Fig. 5-4-4**

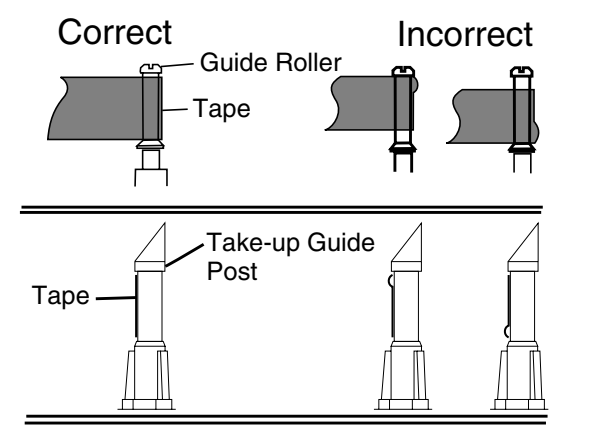


**Fig. 5-4-5**

3. Check to see that the tape runs without creasing at Take-up Guide Post [4] or without snaking between Guide Roller [3] and ACE Head. (Fig. 5-4-3 and 5-4-5)
4. If creasing or snaking is apparent, adjust the Tilt Adj. Screw of the ACE Head. (Fig. 5-4-6)

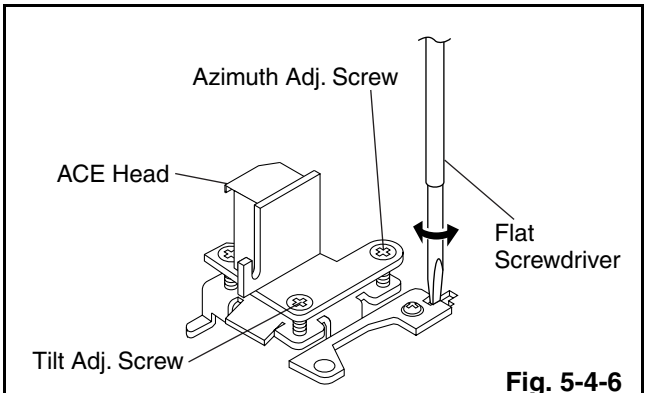


**Fig. 5-4-6**

## 1-B. X Value Alignment

**Purpose:**

To align the Horizontal Position of the Audio/Control/Erase Head.

**Symptom of Misalignment:**

If the Horizontal Position of the Audio/Control/Erase Head is not properly aligned, maximum envelope cannot be obtained at the Neutral position of the Tracking Control Circuit.

1. Connect the oscilloscope to TP301 (C-PB) and TP503 (CTL) on the Main CBA. Use TP504 (RF-SW) as a trigger.
2. Playback the Gray Scale of the Alignment Tape (MH-2) and confirm that the PB FM signal is present.
3. Set the Tracking Control Circuit to the center position by pressing CH UP button then “PLAY” button on the unit. (Refer to note on bottom of page 5-7.)
4. Use the Flat Screwdriver so that the PB FM signal at TP301 (C-PB) is maximum. (Fig. 5-4-6)
5. Press CH UP button on the unit until the CTL waveform has shifted by approx. +2ms. Make sure that the envelope is simply attenuated (shrinks in height) during this process so that you will know the envelope has been at its peak.

6. Press CH DOWN button on the unit until the CTL waveform has shifted from its original position (not the position achieved in step 5, but the position of CTL waveform in step 4) by approximately -2ms. Make sure that the envelope is simply attenuated (shrinks in height) once CTL waveform passes its original position and is further brought in the minus direction.
7. Set the Tracking Control Circuit to the center position by pressing CH UP button and then “PLAY” button.

## 1-C. Checking/Adjustment of Envelope Waveform

**Purpose:**

To achieve a satisfactory picture and precise tracking.

**Symptom of Misalignment:**

If the envelope output is poor, noise will appear in the picture. The tracking will then lose precision and the playback picture will be distorted by any slight variation of the Tracking Control Circuit.

1. Connect the oscilloscope to TP301 (C-PB) on the Main CBA. Use TP504 (RF-SW) as a trigger.
2. Playback the Gray Scale on the Alignment Tape (MH-2). Set the Tracking Control Circuit to the center position by pressing CH UP button and then “PLAY” button on the unit. Adjust the height of Guide Rollers [2] and [3] (Fig. 5-4-3, Page 5-6) watching the oscilloscope display so that the envelope becomes as flat as possible. To do this adjustment, turn the top of the Guide Roller with the Guide Roller Adj. Screwdriver.
3. If the envelope is as shown in Fig. 5-4-7, adjust the height of Guide Roller [2] (Refer to Fig. 5-4-3) so that the waveform looks like the one shown in Fig. 5-4-9.
4. If the envelope is as shown in Fig. 5-4-8, adjust the height of Guide Roller [3] (Refer to Fig. 5-4-3) so that the waveform looks like the one shown in Fig. 5-4-9.
5. When Guide Rollers [2] and [3] (Refer to Fig.5-4-3) are aligned properly, there is no envelope drop either at the beginning or end of track as shown in Fig. 5-4-9.

Dropping envelope level at the beginning of track.

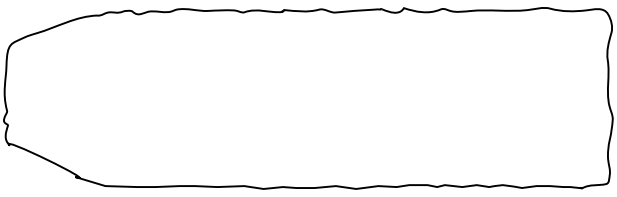


**Fig. 5-4-7**

Dropping envelope level at the end of track.

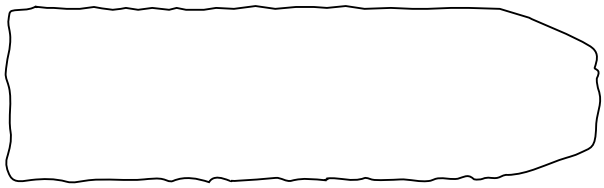


**Fig. 5-4-8**

Envelope is adjusted properly. (No envelope drop)

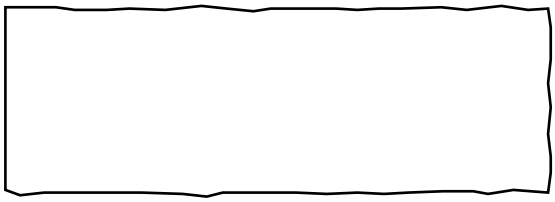


**Fig. 5-4-9**

Note: Upon completion of the adjustment of Guide Rollers [2] and [3] (Refer to Fig. 5-4-3), check the X Value by pushing the CH UP or DOWN buttons alternately, to check the symmetry of the envelope. Check the number of pushes to ensure center position. The number of pushes CH UP button to achieve 1/2 level of envelope should match the number of pushes CH DOWN button from center. If required, redo the “X Value Alignment.”

## 1-D. Azimuth Alignment of Audio/Control/ Erase Head

**Purpose:**

To correct the Azimuth alignment so that the Audio/ Control/Erase Head meets tape tracks properly.

**Symptom of Misalignment:**

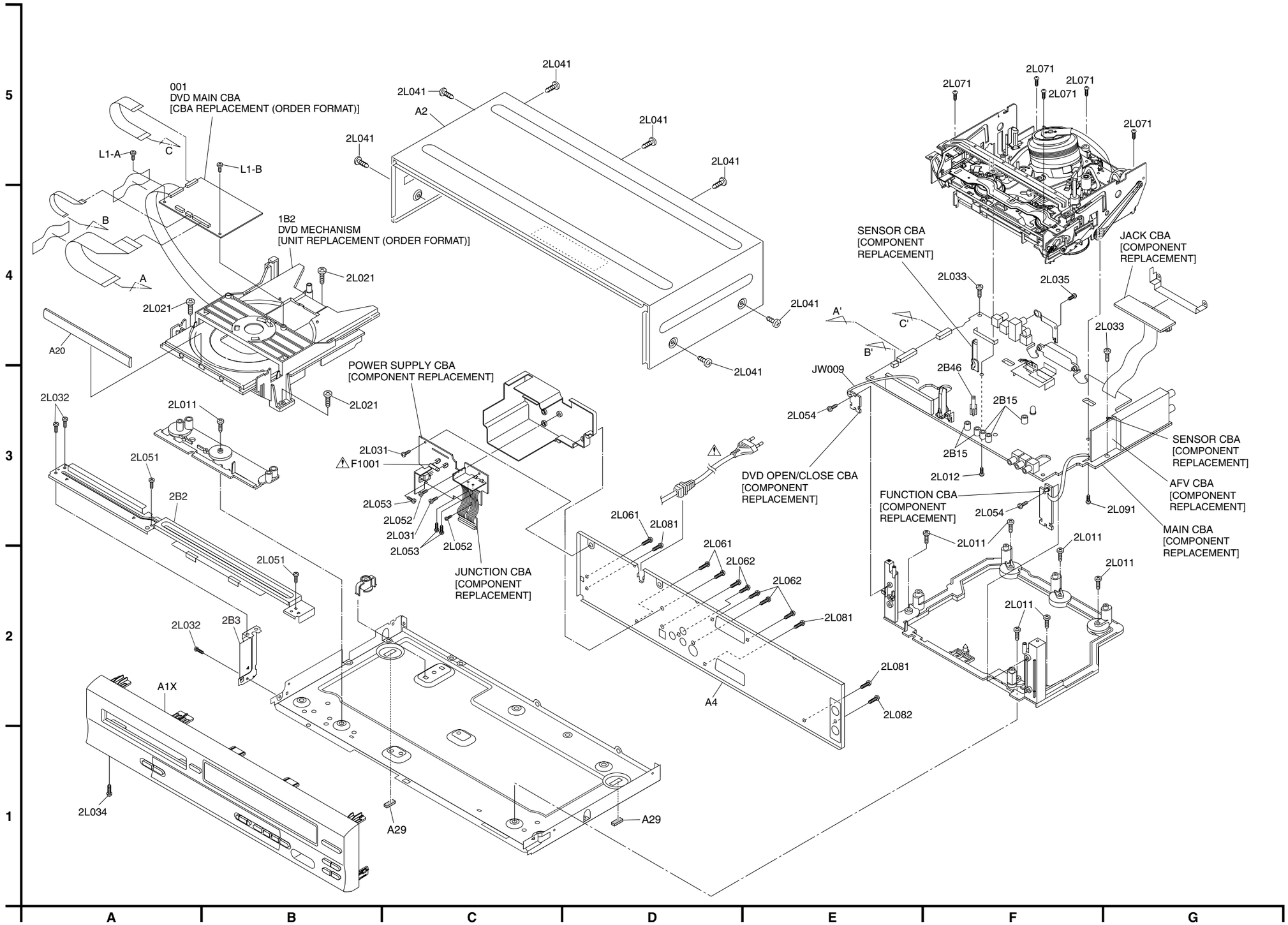
If the position of the Audio/Control/Erase Head is not properly aligned, the Audio S/N Ratio or Frequency Response will be poor.

1. Connect the oscilloscope to the audio output jack on the rear side of the deck.
2. Playback the alignment tape (MH-2) and confirm that the audio signal output level is 8kHz.
3. Adjust Azimuth Adj. Screw so that the output level on the AC Voltmeter or the waveform on the oscilloscope is at maximum. (Fig. 5-4-6)

# 6 EXPLODED VIEWS AND PARTS LIST

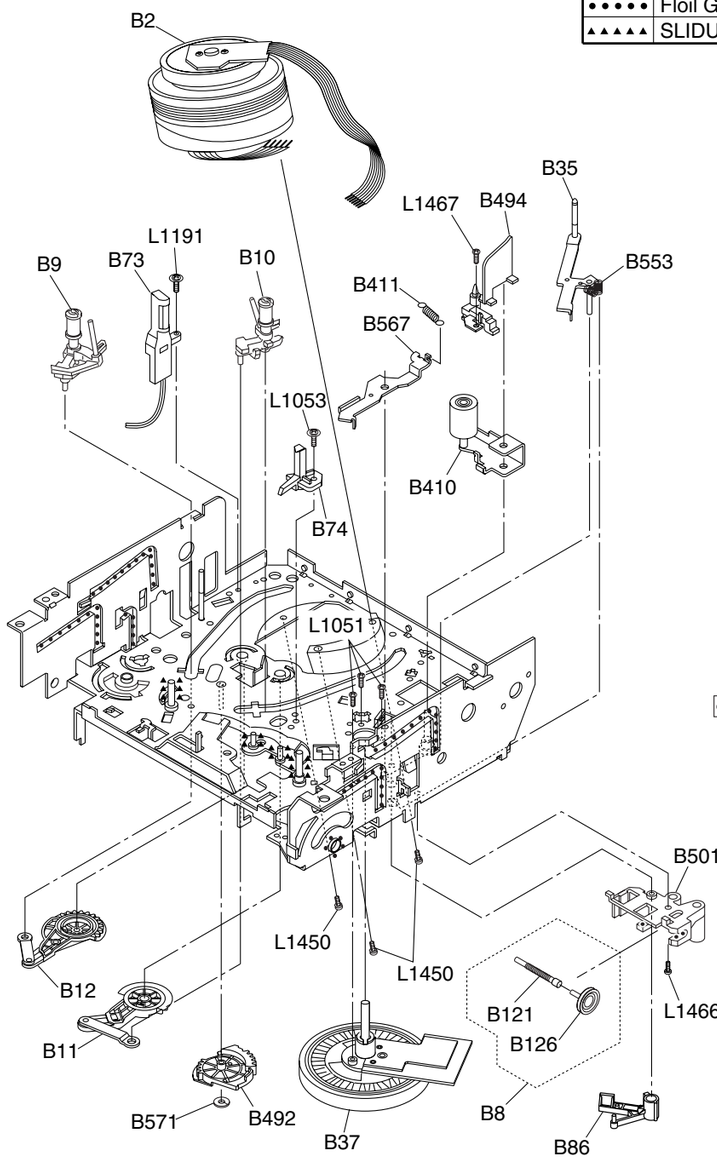
## 6-1 EXPLODED VIEWS

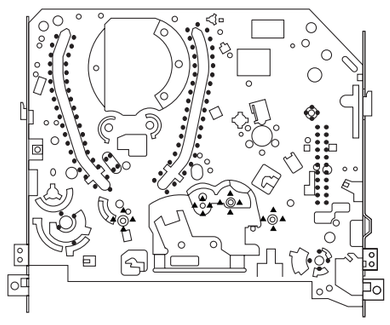
### 6-1-1 Cabinet Section



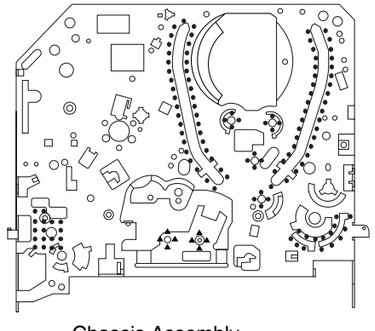
## 6-1-2 Deck Mechanism View 1 Section

| Mark | Description |
|---|---|
| ●●●●● | Floil G-684G or Multemp MH-D (Blue grease) |
| ▲▲▲▲▲ | SLIDUS OIL #150 |



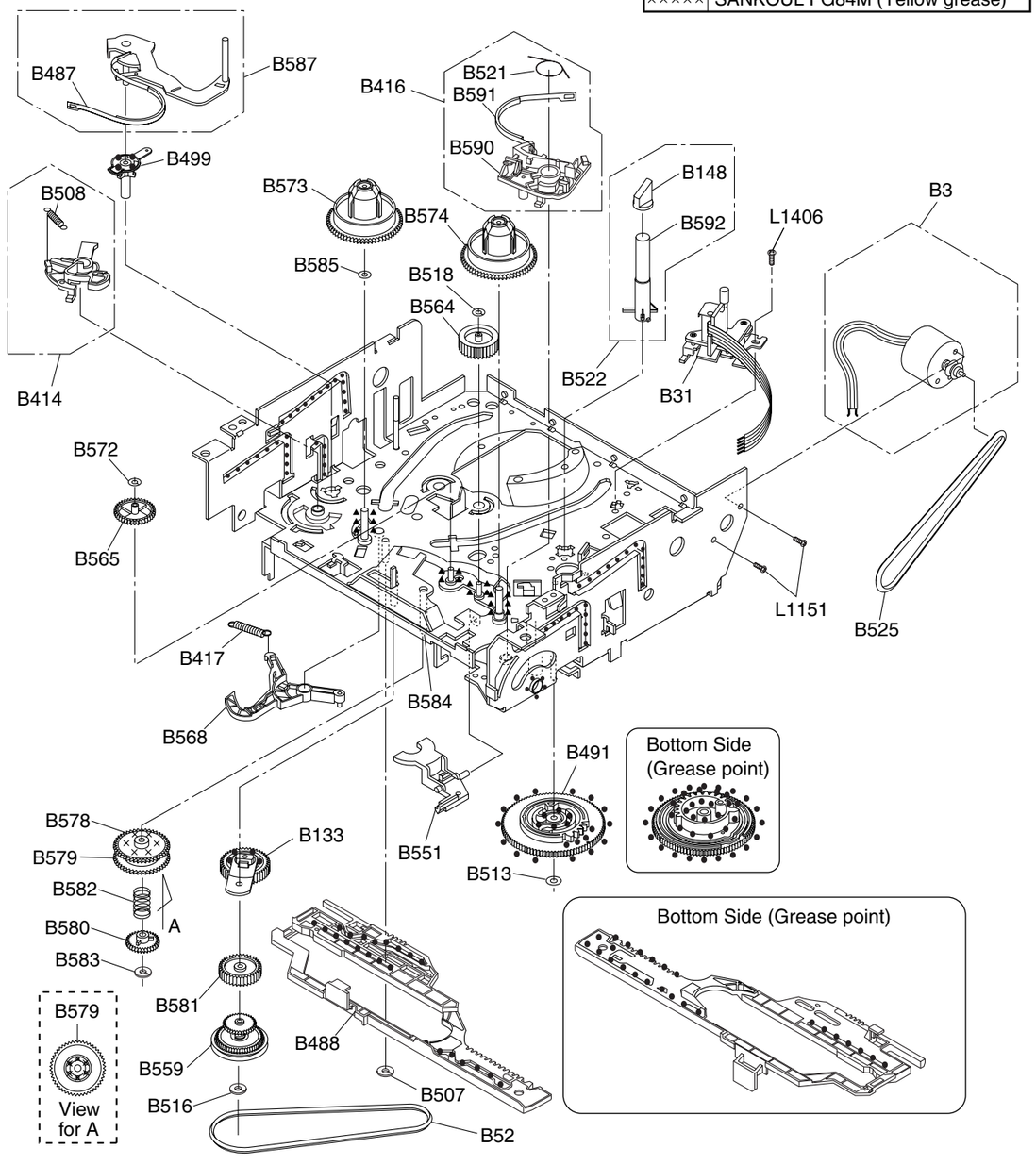
Chassis Assembly
Top View (Lubricating Point)



Chassis Assembly
Bottom View (Lubricating Point)

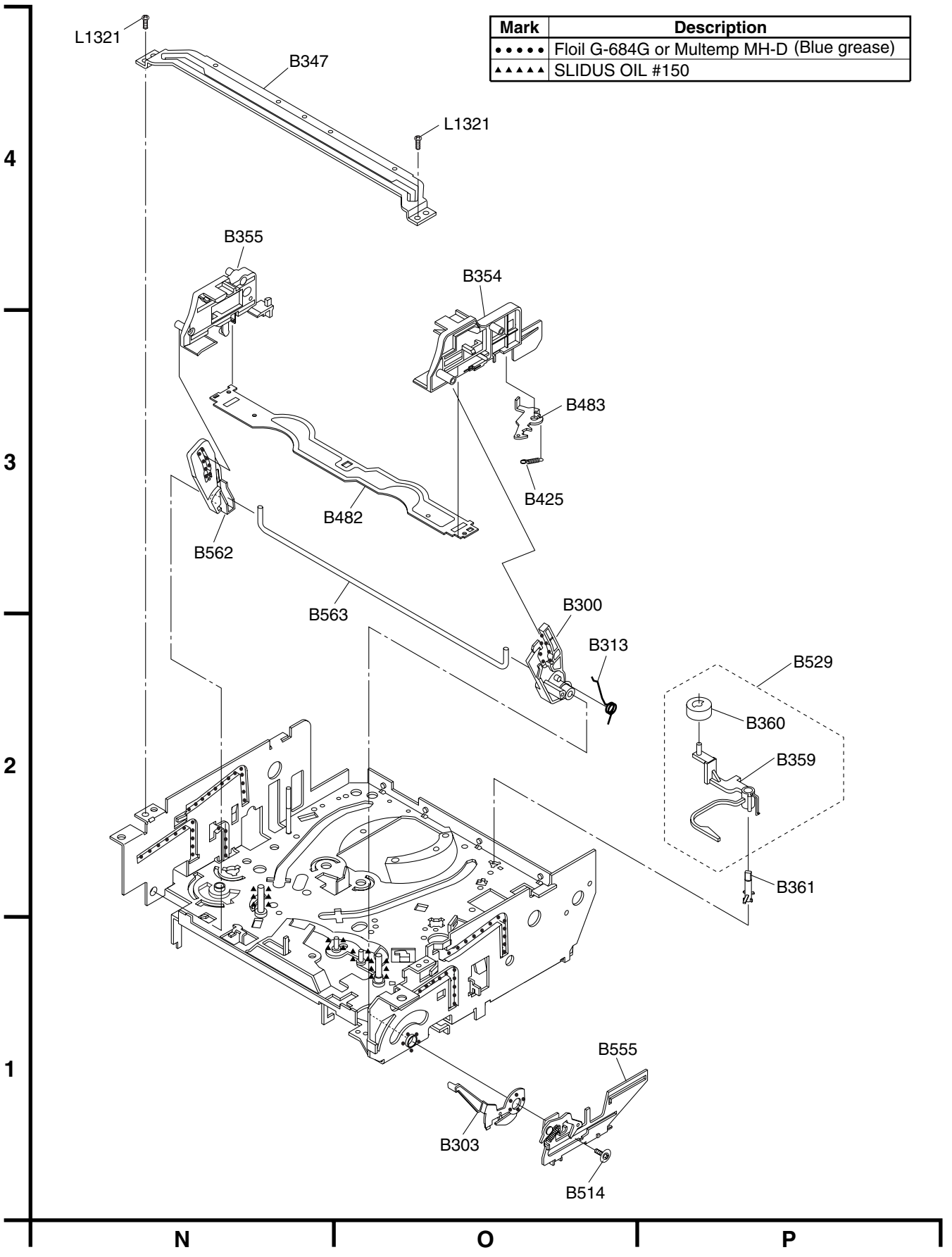
## 6-1-3 Deck Mechanism View 2 Section

| Mark | Description |
|---|---|
| ●●●●● | Floil G-684G or Multemp MH-D (Blue grease) |
| ▲▲▲▲▲ | SLIDUS OIL #150 |
| ×××××| SANKOUL FG84M (Yellow grease) |




H I J K L M

## 6-1-4 Deck Mechanism View 3 Section



# 6-2 REPLACEMENT PARTS LIST

## 6-2-1 Mechanical Parts List

| SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|
| | | **MECHANISM SECTION** |
| A1X | | FRONT ASSEMBLY [DV-PF3E] |
| A1X | | FRONT ASSEMBLY [DV-PF3E(UK)] |
| A2 | | TOP COVER |
| A4 | | PANEL, REAR [DV-PF3E] |
| A4 | | PANEL, REAR [DV-PF3E(UK)] |
| A20 | | PANEL, TRAY |
| A29 | | FOOT |
| 1B2 | | DVD DRIVE ASSY |
| 2B2 | | TOP BRACKET |
| 2B3 | | SIDE BRACKET |
| 2B15 | | BUSH, LED(F) |
| 2B46 | | ROHM HOLDER |
| 2L011 | | SCREW (3X8) |
| 2L012 | | SCREW (M3X8) |
| 2L021 | | SCREW (M3X26) |
| 2L031 | | SCREW (M3X5) |
| 2L032 | | SCREW (M3X5) |
| 2L033 | | SCREW (M3X5) |
| 2L034 | | SCREW (M3X6) |
| 2L035 | | SCREW (M3X5) |
| 2L041 | | SCREW (M3X5) |
| 2L051 | | SCREW (M3X6) |
| 2L052 | | SCREW (M3X6) |
| 2L053 | | SCREW (M3X8) |
| 2L054 | | SCREW (M3X6) |
| 2L061 | | SCREW (M3X8) |
| 2L062 | | SCREW (M3X8) |
| 2L071 | | SCREW (M3X10) |
| 2L081 | | SCREW (M3X5) |
| 2L082 | | SCREW (M3X5) |
| 2L091 | | SCREW (M3X8) |
| B2 | | CYLINDER ASSEMBLY |
| B3 | | LOADING MOTOR ASSEMBLY |
| B8 | | PULLEY ASSEMBLY(HI) |
| B9 | | MOVING GUIDE (S) |
| B10 | | MOVING GUIDE (T) |
| B11 | | LOADING ARM(TU) ASSEMBLY |
| B12 | | LOADING ARM(SP) ASSEMBLY |
| B31 | | AC HEAD ASSEMBLY |
| B35 | | TAPE GUIDE ARM ASSEMBLY |
| B37 | | CAPSTAN MOTOR |
| B52 | | CAP BELT |
| B73 | | FE HEAD ASSEMBLY |
| B74 | | PRISM |
| B86 | | F BRAKE ASSEMBLY(HI) |
| B121 | | WORM |
| B126 | | PULLEY |
| B133 | | IDLER ASSEMBLY(HI) |
| B148 | | TG CAP |
| B300 | | CASSETTE DRIVE LEVER(TU) |
| B303 | | F DOOR OPENER |
| B313 | | CASSETTE DRIVE SPRING |
| B347 | | GUIDE HOLDER A |
| B354 | | SLIDER(TU) |
| B355 | | SLIDER(SP) |
| B359 | | CLEANER LEVER |
| B360 | | CLEANER ROLLER |
| B361 | | CL POST |
| B410 | | PINCH ARM ASSEMBLY(1) |
| B411 | | PINCH SPRING |
| B414 | | M BRAKE(SP) ASSEMBLY(HI) |
| B416 | | M BRAKE(TU) ASSEMBLY(HI) |
| B417 | | TENSION SPRING |
| B425 | | LOCK LEVER SPRING |
| B482 | | CASSETTE PLATE |
| B483 | | LOCK LEVER |
| B487 | | BAND BRAKE(SP) |
| B488 | | MODE LEVER(HI) |
| B491 | | CAM GEAR(A)(HI) |
| B492 | | MODE GEAR(LM) |
| B494 | | CASSETTE DOOR OPENER |
| B499 | | T LEVER HOLDER |
| B501 | | WORM HOLDER |
| B507 | | REEL WASHER |
| B508 | | BRAKE SPRING(S) |
| B513 | | CAM WASHER |
| B514 | | SCREW RACK |
| B516 | | REEL WASHER |
| B518 | | WASHER |
| B521 | | REV BRAKE SPG(HI) |
| B522 | | TG POST ASSEMBLY |
| B525 | | LDG BELT |
| B529 | | CLEANER ASSEMBLY |
| B551 | | FF ARM(HI) |
| B553 | | REV SPRING |
| B555 | | RACK ASSEMBLY |
| B559 | | CLUTCH ASSEMBLY(HI) |
| B562 | | CASSETTE DRIVE LEVER(SP) |
| B563 | | SLIDER SHAFT |
| B564 | | M GEAR(HI) |
| B565 | | SENSOR GEAR(HI) |
| B567 | | PINCH ARM(B) |
| B568 | | BT ARM |
| B571 | | WASHER |
| B572 | | WASHER |
| B573 | | REEL S |
| B574 | | REEL T |
| B578 | | TR GEAR A |

| SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|
| B579 | | TR GEAR B |
| B580 | | TR GEAR C |
| B581 | | CENTER GEAR |
| B582 | | TR GEAR SPRING |
| B583 | | CAM WASHER |
| B584 | | TR GEAR SHAFT |
| B585 | | PSW |
| B587 | | TENSION LEVER ASSEMBLY |
| B590 | | BRAKE ARM(TU) |
| B591 | | BAND BRAKE(TU) |
| B592 | | TG POST |
| L1051 | | SCREW |
| L1053 | | SCREW |
| L1151 | | SCREW |
| L1191 | | SCREW |
| L1321 | | SCREW |
| L1406 | | SCREW |
| L1450 | | SCREW (M2.6X5) |
| L1466 | | SCREW (M2.6X6) |
| L1467 | | SCREW (M2.6X5) |
| L1-A | | SCREW 3X8 |
| L1-B | | SCREW 3X8 |
| 001 | | PWB ASSY DVD MAIN |
| | | **ACCESSORIES** |
| X1 | | REMOTE CONTROL UNIT [DV-PF3E] |
| X1 | | REMOTE CONTROL UNIT [DV-PF3E(UK)] |
| X3 | | RF CORD PAL |

| SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|

## 6-2-2 Electrical Parts List

**Note:** Although some parts in the schematic diagrams have different names from those in the parts list, there is no problem in replacing parts.

| SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|
| | | **RESISTOR** |
| VR501 | | CARBON P.O.T. 100K OHM B |
| | | **SEMI-CONDUCTORS** |
| D2 | | SWITCHING DIODE 1SS133(T-77) |
| D013 | | FAST RECOVERY DIODE ERA18-04 |
| D015 | | ZENER DIODE MTZJT-775.6C |
| D016 | | SCHOTTKY BARRIER DIODE SB340 |
| D017 | | ZENER DIODE MTZJT-778.2A |
| D018 | | FAST RECOVERY DIODE ERA18-04 |
| D051 | | RECTIFIER DIODE 1N4005 |
| D052 | | RECTIFIER DIODE 1N4005 |
| D053 | | RECTIFIER DIODE 1N4005 |
| D054 | | ZENER DIODE MTZJT-7710B |
| D056 | | ZENER DIODE MTZJT-7733D |
| D057 | | RECTIFIER DIODE 1N4005 |
| D101 | | ZENER DIODE DZ-11BSAT265 |
| D102 | | ZENER DIODE DZ-11BSAT265 |
| D103 | | ZENER DIODE DZ-11BSAT265 |
| D104 | | ZENER DIODE DZ-11BSAT265 |
| D105 | | ZENER DIODE DZ-11BSAT265 |
| D106 | | ZENER DIODE DZ-11BSAT265 |
| D107 | | ZENER DIODE DZ-11BSAT265 |
| D108 | | ZENER DIODE DZ-11BSAT265 |
| D109 | | ZENER DIODE DZ-11BSAT265 |
| D110 | | ZENER DIODE DZ-11BSAT265 |
| D112 | | ZENER DIODE DZ-11BSAT265 |
| D113 | | ZENER DIODE DZ-11BSAT265 |
| D115 | | ZENER DIODE DZ-11BSAT265 |
| D118 | | ZENER DIODE DZ-11BSAT265 |
| D119 | | ZENER DIODE DZ-11BSAT265 |
| D121 | | ZENER DIODE DZ-11BSAT265 |
| D301 | | SWITCHING DIODE 1SS133(T-77) |
| D501 | | LED(RED) 204HD/E |
| D502 | | LED(GREEN) 204-10GD/S957 |
| D503 | | LED(GREEN) 204-10GD/S957 |
| D504 | | LED(RED) 204HD/E |
| D510 | | SWITCHING DIODE 1SS133(T-77) |
| D511 | | ZENER DIODE DZ-7.5BSAT265 |
| D512 | | SWITCHING DIODE 1SS133(T-77) |
| D555 | | LED SIR-563ST3F Q |
| D592 | | LED(RED) 204HD/E |
| D593 | | LED(RED) 204HD/E |
| D611 | | SWITCHING DIODE 1SS133(T-77) |
| D701 | | ZENER DIODE MTZJT-7733D |
| D751 | | ZENER DIODE MTZJT-778.2A |
| D1001 | | RECTIFIER DIODE 1N4005 |
| D1002 | | RECTIFIER DIODE 1N4005 |
| D1003 | | RECTIFIER DIODE 1N4005 |
| D1004 | | RECTIFIER DIODE 1N4005 |
| D1006 | | SWITCHING DIODE 1SS133(T-77) |
| D1008 | | SCHOTTKY BARRIER DIODE ERB81-004 |
| D1011 | | RECTIFIER DIODE BA159 |
| D1012 | | SWITCHING DIODE 1SS133(T-77) |
| D1016 | | RECTIFIER DIODE FR101 |
| D1017 | | ZENER DIODE DZ-20BSBT265 |
| D1018 | | SWITCHING DIODE 1SS133(T-77) |
| D1022 | | SWITCHING DIODE 1SS133(T-77) |
| D1024 | | SWITCHING DIODE 1SS133(T-77) |
| D1025 | | SWITCHING DIODE 1SS133(T-77) |
| D1026 | | ZENER DIODE DZ-5.1BSBT265 |
| D1030 | | SCHOTTKY BARRIER DIODE SB340 |
| D1052 | | SCHOTTKY BARRIER DIODE SB140 |
| D1053 | | RECTIFIER DIODE 1N4005 |
| D1054 | | RECTIFIER DIODE 1N4005 |
| D1055 | | RECTIFIER DIODE 1N4005 |
| D1057 | | RECTIFIER DIODE 1N4005 |
| D1060 | | RECTIFIER DIODE 1N4005 |
| D1301 | | ZENER DIODE MTZJT-775.6B |
| D1401 | | ZENER DIODE DZ-11BSAT265 |
| D1402 | | ZENER DIODE DZ-11BSAT265 |
| IC1 | | IC MSP3417G-QG-B8 |
| IC301 | | IC LA71750AM-MTB |
| IC451 | | IC LA72648M |
| IC501 | | IC M37762MCA-AB0GP/QSZAA0RMB158 |
| IC502 | | IC BR24C02F-W |
| IC611 | | V.F.D. 7-BT-292GN |
| IC612 | | IC PT6315-S(-TP) |
| IC631 | | IC LC74793JM-TRM |
| IC751 | | IC TC4053BF(N) |
| ! IC1001 | | PHOTOCOUPLER EL817B |
| IC1051 | | VOLTAGE REGULATOR PQ070XF01SZ |
| IC1052 | | VOLTAGE REGULATOR PQ070XF01SZ |
| IC1201 | | IC KIA4558P |
| IC1204 | | IC 0C-0805T*002 |
| IC1402 | | IC MM1567AJBE |
| Q051 | | TRANSISTOR KTA1281(Y) |
| Q052 | | TRANSISTOR KRC103M |
| Q053 | | TRANSISTOR KRA104M |
| Q054 | | TRANSISTOR KRC103M |
| Q055 | | TRANSISTOR KTC3199(Y) |
| Q056 | | TRANSISTOR KTC3205(Y) |
| Q057 | | TRANSISTOR KRA103M |
| Q058 | | TRANSISTOR KTA1266(GR) |
| Q059 | | TRANSISTOR KRC103M |
| Q103 | | TRANSISTOR KTA1266(GR) |
| Q104 | | TRANSISTOR KTA1266(GR) |
| Q105 | | TRANSISTOR KTC3199(Y) |
| Q107 | | TRANSISTOR KTC3199(Y) |

| SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|
| Q108 | | TRANSISTOR KTC3199(Y) |
| Q301 | | TRANSISTOR KTA1266(GR) |
| Q302 | | TRANSISTOR KTC3199(Y) |
| Q403 | | TRANSISTOR KTC3203(Y) |
| Q404 | | TRANSISTOR KTA1266(GR) |
| Q405 | | TRANSISTOR KRA103M |
| Q406 | | TRANSISTOR KTC3875Y-RTK |
| Q502 | | TRANSISTOR KTC3199(Y) |
| Q503 | | PHOTO TRANSISTOR PT204-6B-12 |
| Q504 | | PHOTO TRANSISTOR PT204-6B-12 |
| Q506 | | PHOTO TRANSISTOR PT204-6B-12 |
| Q507 | | TRANSISTOR KTC3199(Y) |
| Q508 | | TRANSISTOR KTC3199(Y) |
| Q509 | | TRANSISTOR KTC3199(Y) |
| Q510 | | TRANSISTOR KRC103M |
| Q511 | | TRANSISTOR KTC3199(Y) |
| Q513 | | TRANSISTOR KRC103M |
| Q514 | | TRANSISTOR KTC3199(BL) |
| Q515 | | TRANSISTOR KTC3199(BL) |
| Q752 | | TRANSISTOR KRC103M |
| Q1003 | | TRANSISTOR KTC3199(Y) |
| Q1008 | | TRANSISTOR KTC3199(Y) |
| Q1009 | | TRANSISTOR KTC3199(Y) |
| Q1052 | | TRANSISTOR KTC3203(Y) |
| Q1053 | | TRANSISTOR KTA1267(Y) |
| Q1054 | | TRANSISTOR KTC3199(Y) |
| Q1055 | | TRANSISTOR KTC3203(Y) |
| Q1201 | | TRANSISTOR KTC3199(Y) |
| Q1202 | | TRANSISTOR KTC3199(Y) |
| Q1203 | | TRANSISTOR KTA1266(GR) |
| Q1204 | | TRANSISTOR KTA1266(GR) |
| Q1351 | | TRANSISTOR KTC3199(Y) |
| Q1352 | | TRANSISTOR KTC3199(Y) |
| Q1502 | | TRANSISTOR KRC103M |
| Q1505 | | TRANSISTOR KRC103M |
| **COILS** | | |
| L1 | | INDUCTOR 10UH-K-26T |
| L3 | | INDUCTOR 18UH-K-26T |
| L4 | | INDUCTOR 10UH-K-26T |
| L013 | | CHOKE COIL 47UH-K |
| L052 | | CHOKE COIL 47UH-K |
| L053 | | INDUCTOR 100UH-K-26T |
| L101 | | BEAD CORE |
| L102 | | BEAD CORE |
| L251 | | INDUCTOR 5.6UH |
| L302 | | INDUCTOR 100UH |
| L401 | | CHOKE COIL 47UH |
| L402 | | INDUCTOR 47UH-K |
| L451 | | INDUCTOR 47UH-K |

| SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|
| L501 | | INDUCTOR 100UH |
| L503 | | INDUCTOR 1.8UH |
| L701 | | INDUCTOR 15UH |
| L703 | | CHOKE COIL 47UH |
| L704 | | INDUCTOR 10UH-K |
| L1001 | | BEAD CORE |
| L1002 | | BEAD CORE |
| L1009 | | CHOKE COIL 47UH |
| L1010 | | CHOKE COIL 47UH |
| L1011 | | CHOKE COIL 47UH |
| L1012 | | CHOKE COIL 47UH |
| L1251 | | INDUCTOR 0.47UH |
| L1351 | | INDUCTOR 100UH |
| L1521 | | CHOKE COIL 47UH |
| L2001 | | INDUCTOR 100UH |
| **CRYSTALS** | | |
| X1 | | X'TAL 18.432MHZ |
| X301 | | X'TAL 4.433619MHZ |
| X501 | | X'TAL 12.000MHZ |
| X502 | | X'TAL 32.768KHZ(20PPM) |
| **MISCELLANEOUS** | | |
| CN1 | | ANGLE PIN HEADER (9P) |
| CN701 | | AFV PCB ASSEMBLY |
| CN1051 | | FMN CONNECTOR (22P) |
| CN1601 | | FMN CONNECTOR (18P) |
| ! F1001 | | FUSE T1.6AL/250V |
| FH1001 | | FUSE HOLDER MSF-015 |
| FH1002 | | FUSE HOLDER MSF-015 |
| JK751 | | RCA JACK |
| JK752 | | RCA JACK |
| JK1202 | | RCA JACK |
| JK1401 | | S TYPE JACK |
| JW009 | | FLAT CABLE, 2P |
| PS502 | | PHOTO INTERRUPTER RPI-302C70 |
| RM2001 | | REMOTE RECEIVER PIC-37043LU |
| SW501 | | TACT SWITCH |
| SW506 | | LEAF SWITCH |
| SW507 | | ROTARY MODE SWITCH |
| SW591 | | TACT SWITCH |
| SW592 | | TACT SWITCH |
| SW593 | | TACT SWITCH |
| SW594 | | TACT SWITCH |
| SW595 | | TACT SWITCH |
| SW601 | | TACT SWITCH |
| SW602 | | TACT SWITCH |
| SW603 | | TACT SWITCH |
| SW2020 | | TACT SWITCH |

| SYMBOL-NO | P-NO | DESCRIPTION | SYMBOL-NO | P-NO | DESCRIPTION |
|---|---|---|---|---|---|
| SW2021 | | TACT SWITCH | | | |
| SW2022 | | TACT SWITCH | | | |
| TU701 | | TUNER UNIT TMDG2-631A [DV-PF3E] | | | |
| TU701 | | TUNER UNIT TMDG2-632A [DV-PF3E(UK)] | | | |

# THE UPDATED PARTS LIST

# FOR THIS MODEL IS

# AVAILABLE ON ESTA

# SCHEMATIC, CIRCUIT BOARD AND BLOCK DIAGRAMS

# 1 SCHEMATIC DIAGRAMS / CBA'S AND TEST POINTS

## Standard Notes

## WARNING

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark " ⚠ " in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

### Capacitor Temperature Markings

| Mark | Capacity change rate | Standard temperature | Temperature range |
|---|---|---|---|
| (B) | ±10% | 20°C | -25~+85°C |
| (F) | +30 - 80% | 20°C | -25~+85°C |
| (SR) | ±15% | 20°C | -25~+85°C |
| (Z) | +30 - 80% | 20°C | -10~+70°C |

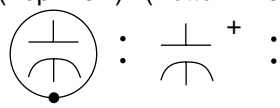
## Notes:

1. Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
2. All resistance values are indicated in ohms ($K=10^3$, $M=10^6$).
3. Resistor wattages are 1/4W or 1/6W unless otherwise specified.
4. All capacitance values are indicated in μF ($P=10^{-6}$ μF).
5. All voltages are DC voltages unless otherwise specified.
6. Electrical parts such as capacitors, connectors, diodes, IC's, transistors, resistors, switches, and fuses are identified by four digits. The first two digits are not shown for each component. In each block of the diagram, there is a note such as shown below to indicate these abbreviated two digits.

**Capacitors and transistors are represented by the following symbols.**

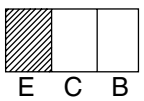
CBA Symbols

(Top View) (Bottom View)



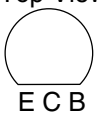
: Electrolytic Capacitor

(Bottom View)




: Transistor or Digital Transistor

(Top View)

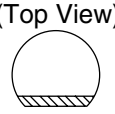



NPN Transistor

(Top View)

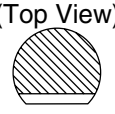

PNP Transistor

(Top View)




NPN Digital Transistor

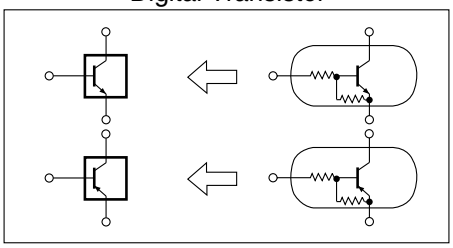
(Top View)




PNP Digital Transistor

Schematic Diagram Symbols

Digital Transistor



**LIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:**

**1. CAUTION:**

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.

**2. CAUTION:**

Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F1001) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

**3. Note:**

(1) Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.

(2) To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

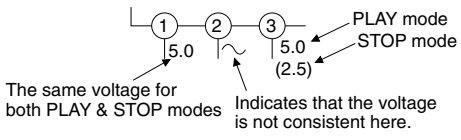
**4. Wire Connectors**

(1) Prefix symbol "CN" means "connector" (can disconnect and reconnect).

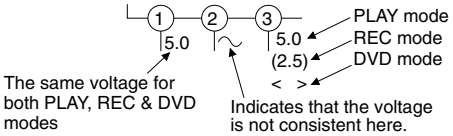
(2) Prefix symbol "CL" means "wire-solder holes of the PCB" (wire is soldered directly).

**5. Voltage indications for PLAY and REC modes on the schematics are as shown below:**

< DVD Section >

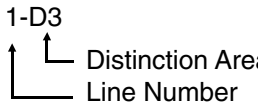



< VCR Section >



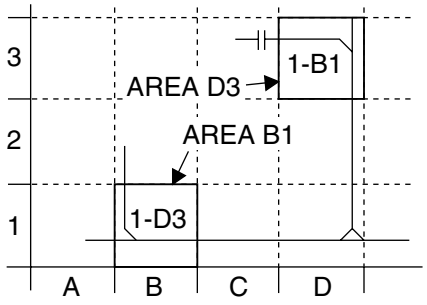

Unit: Volts

**6. How to read converged lines**




Examples:

1. "1-D3" means that line number "1" goes to area "D3".
2. "1-B1" means that line number "1" goes to area "B1".




**7. Test Point Information**

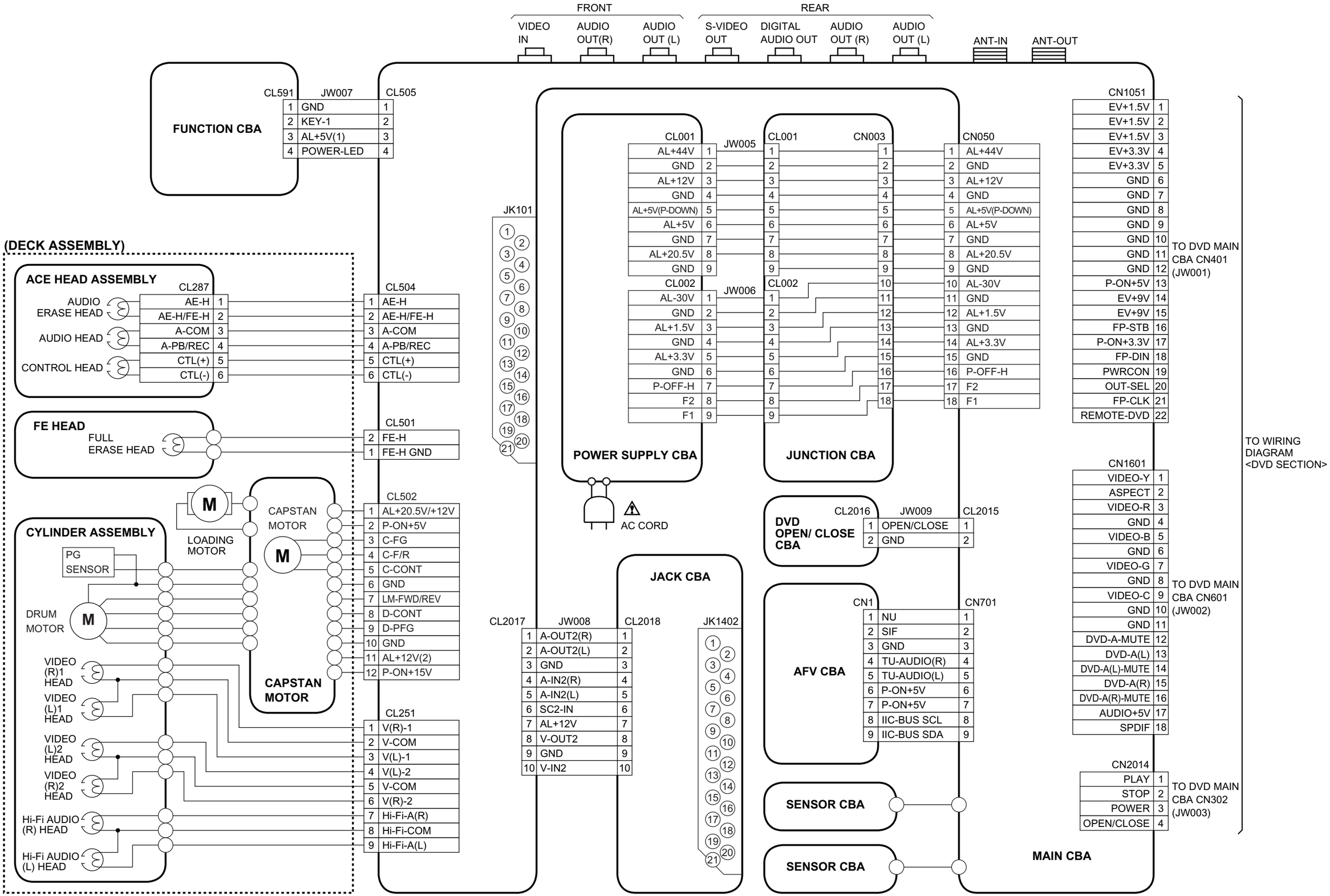
: Indicates a test point with a jumper wire across a hole in the PCB.

: Used to indicate a test point with a component lead on foil side.

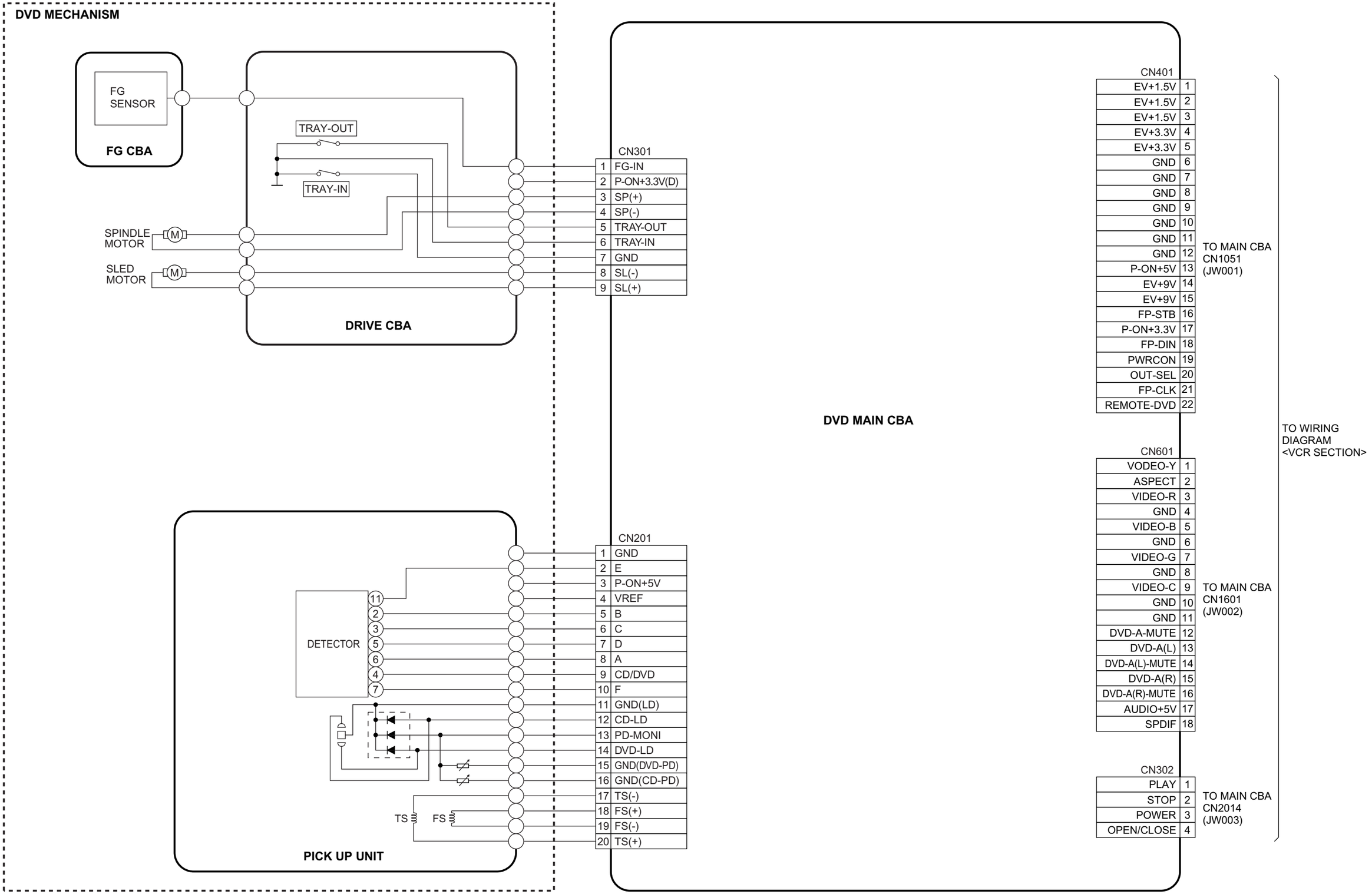
: Used to indicate a test point with no test pin.

: Used to indicate a test point with a test pin.

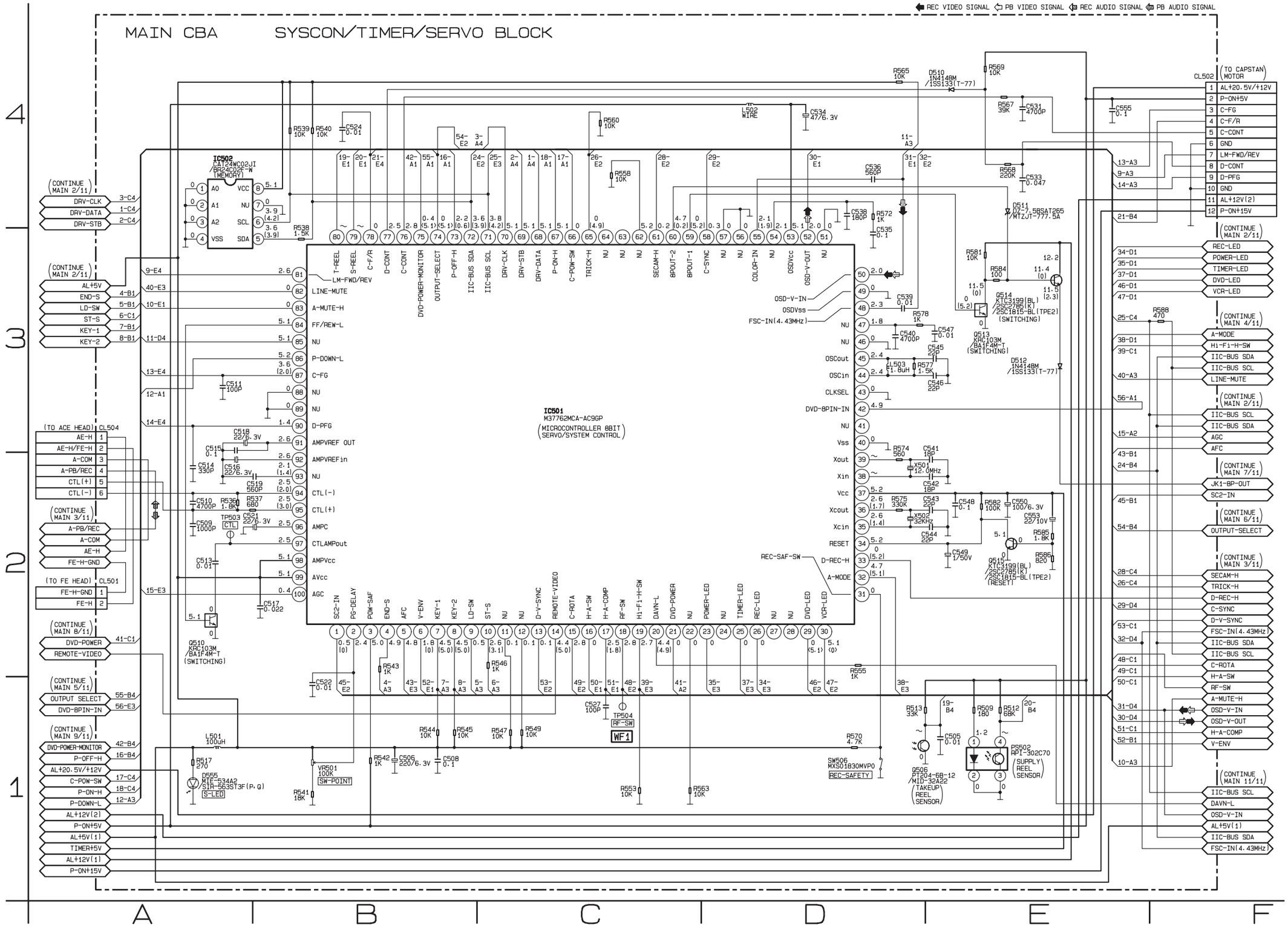
# 2 WIRING DIAGRAMS
## 2-1 VCR Section



## 2-2 DVD Section

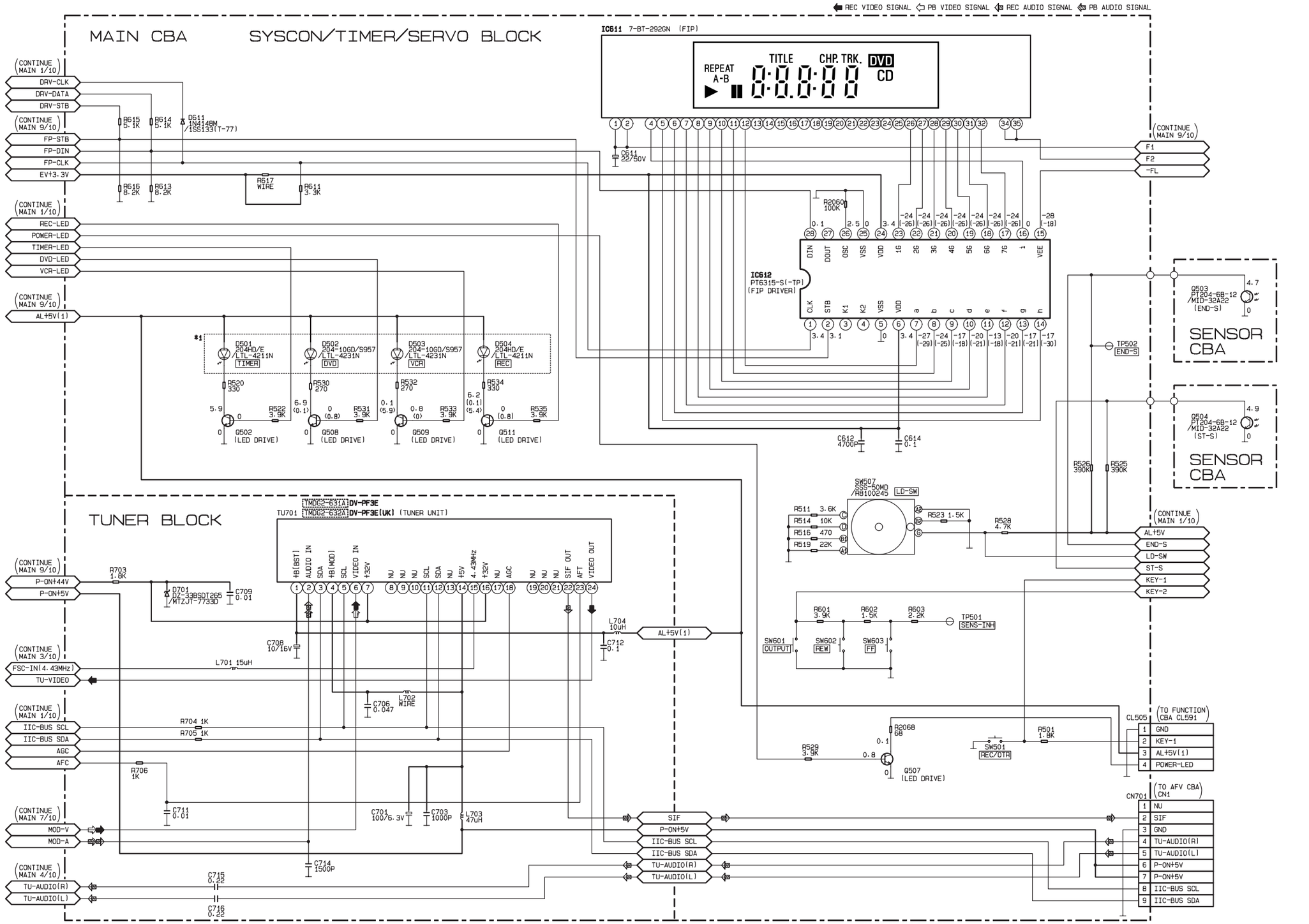


# 2 SCHEMATIC DIAGRAMS
## 2-1 Main 1/11 Schematic Diagram

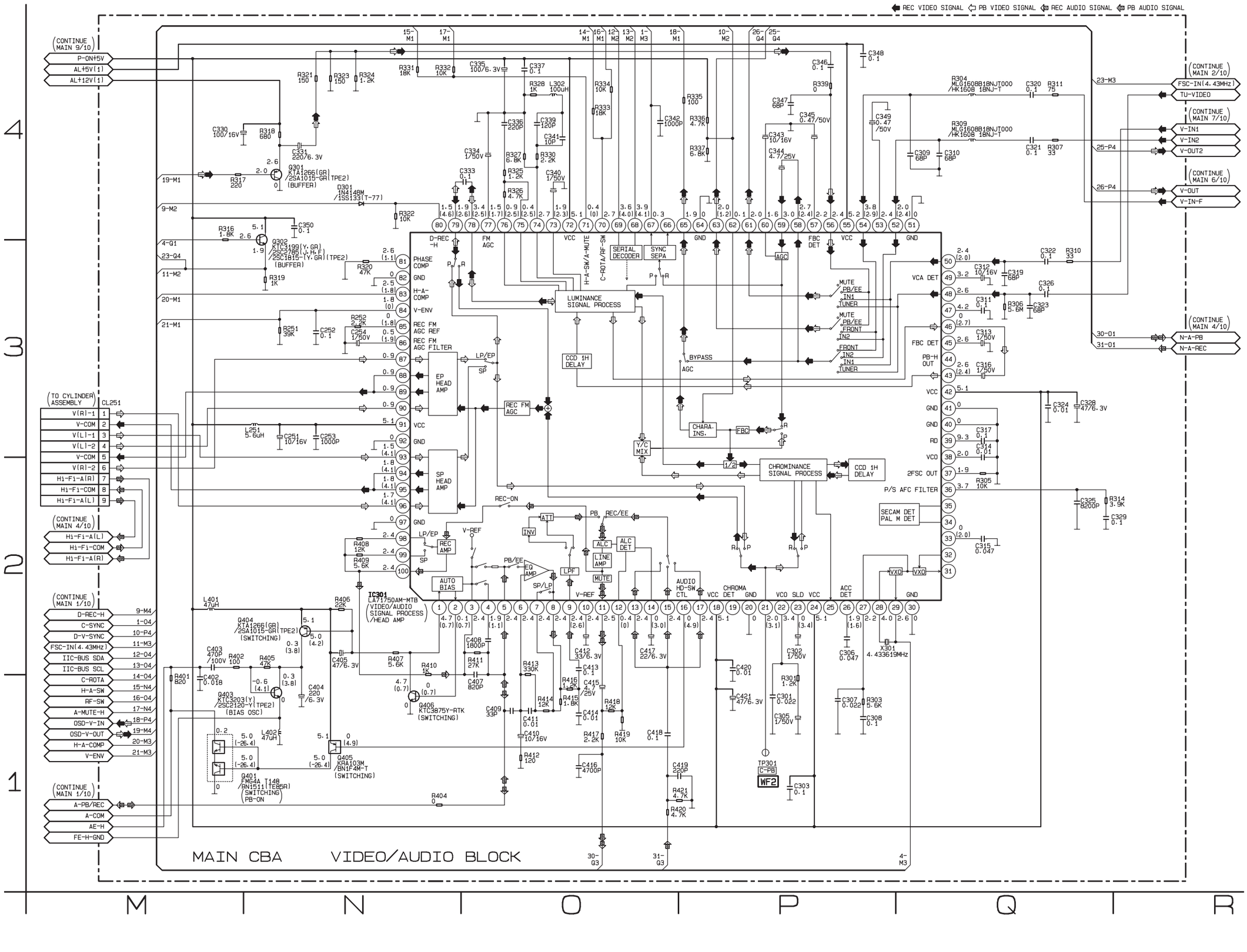


# 3-2 Main 2/10 & Sensor Schematic Diagrams

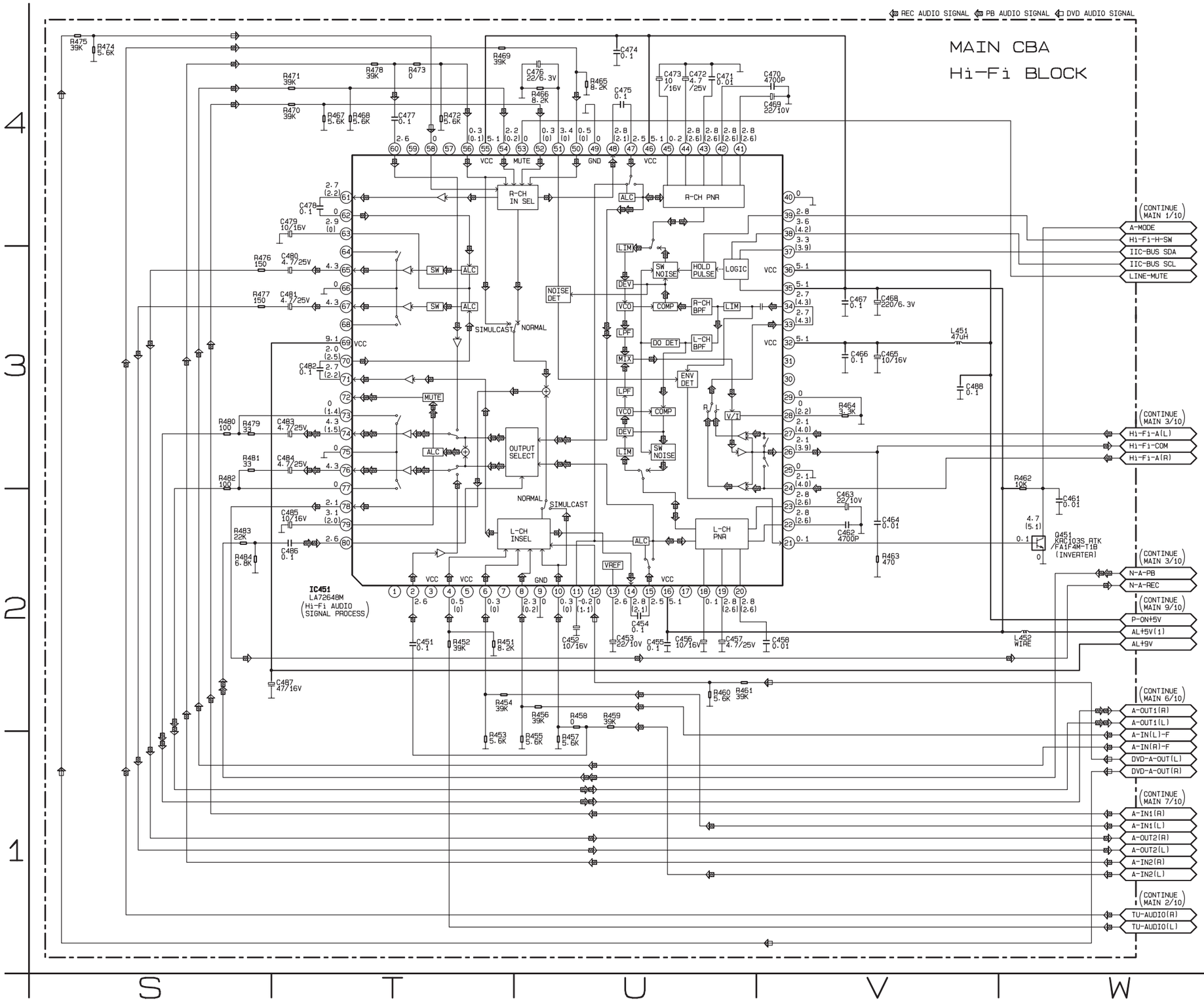
**＊1 Note:**
When it is necessary to replace one or more of the following Diodes, all four should be replaced: D501, D502, D503, D504.



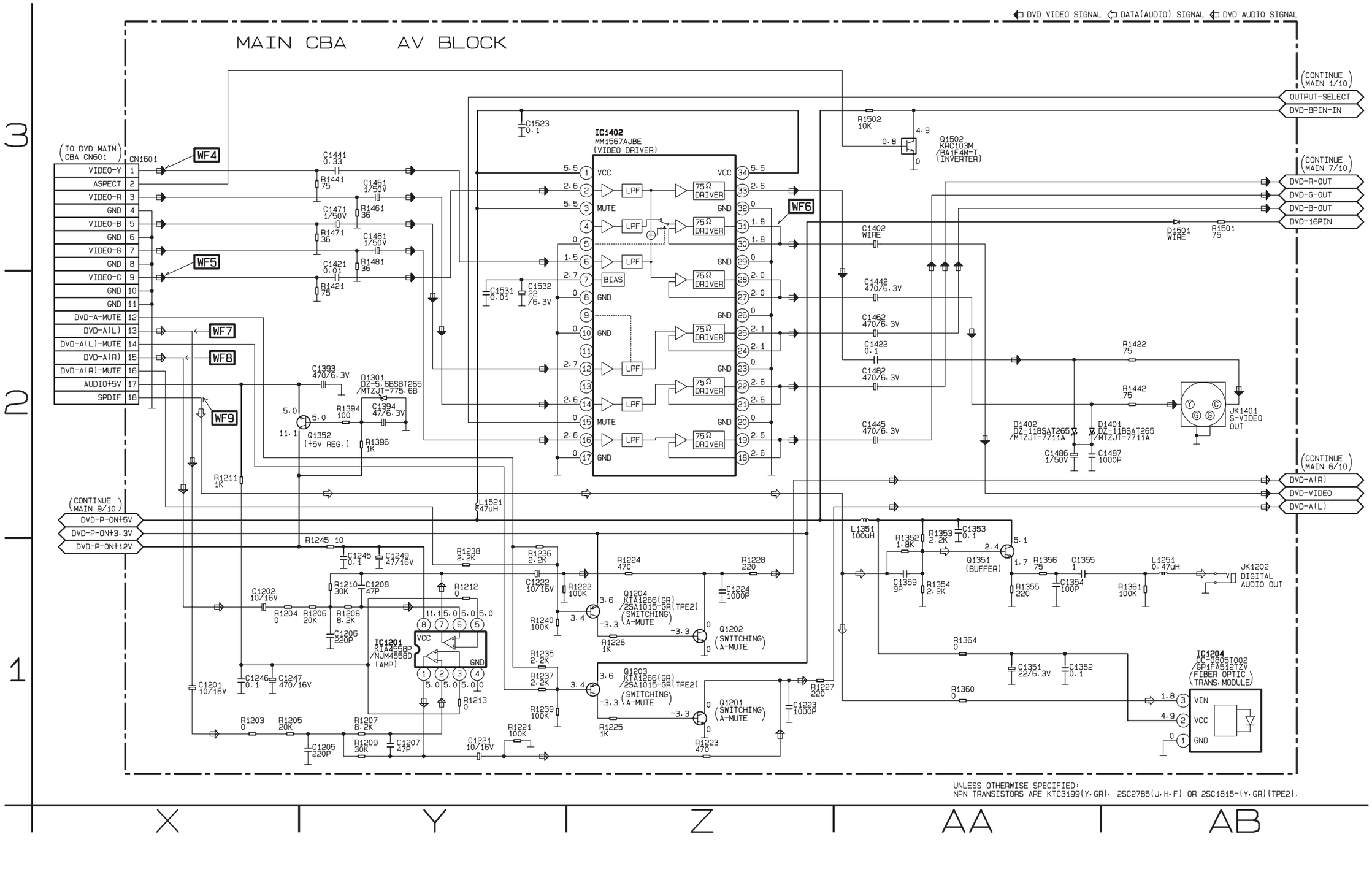
# 3-3 Main 3/10 Schematic Diagram



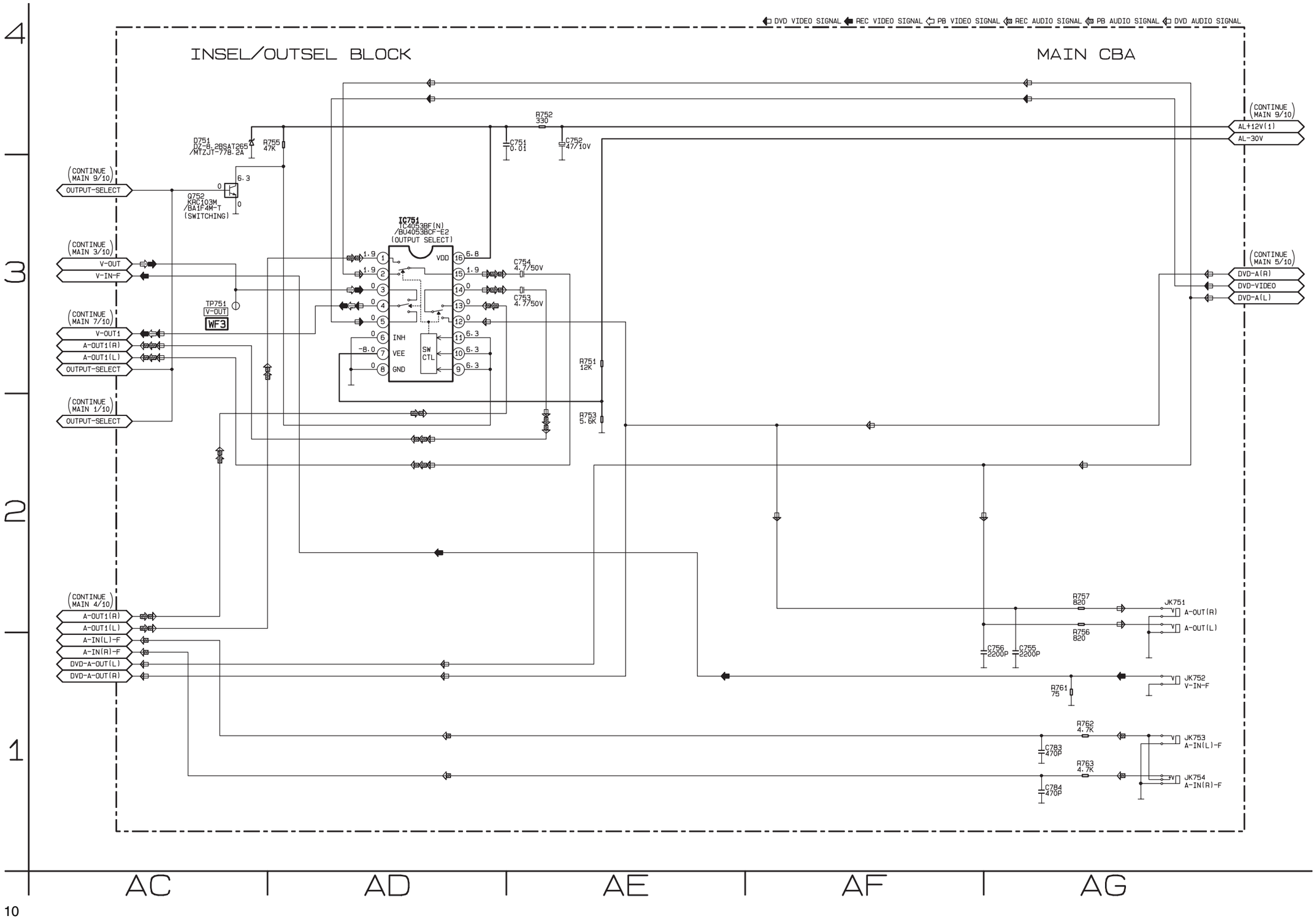
## 3-4 Main 4/10 Schematic Diagram



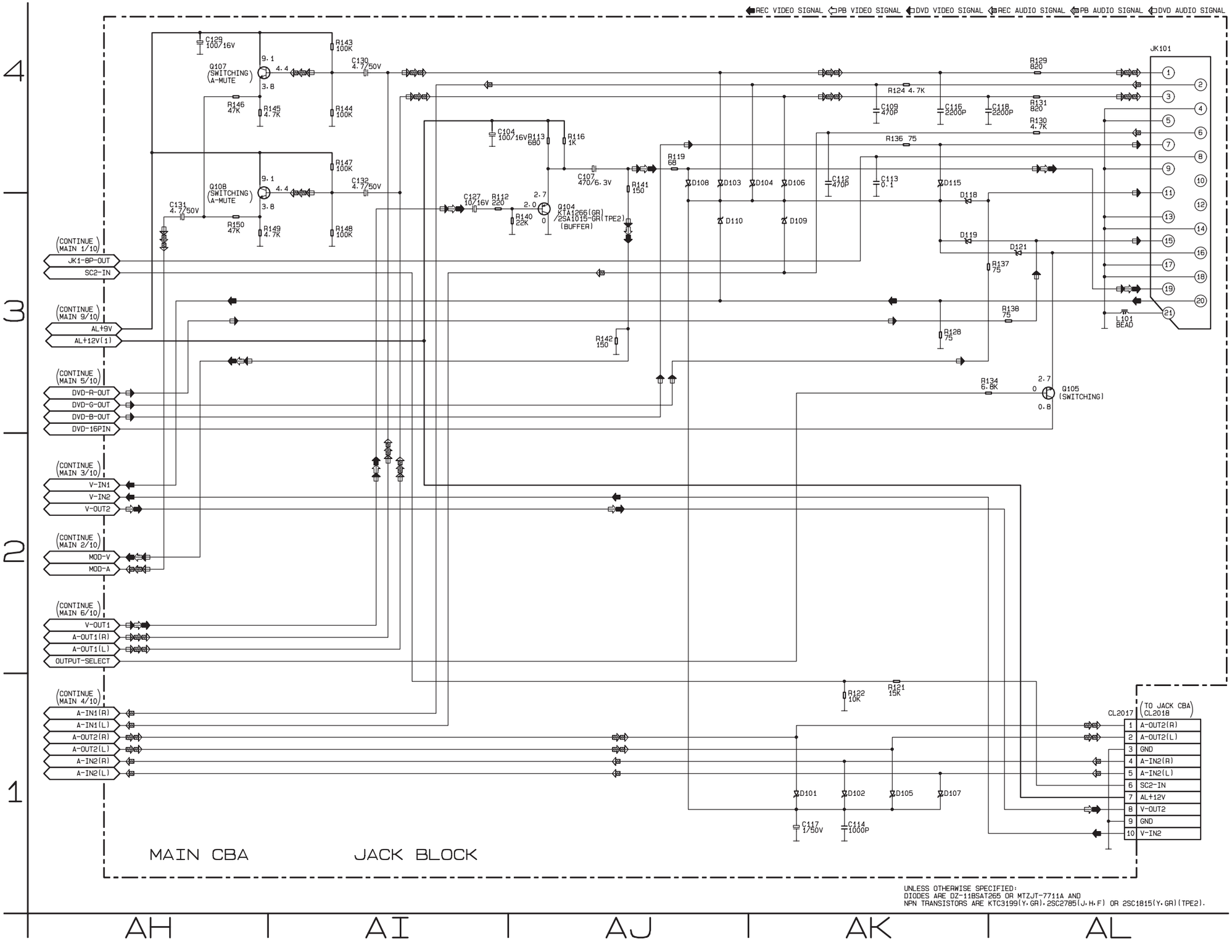
## 3-5 Main 5/10 Schematic Diagram



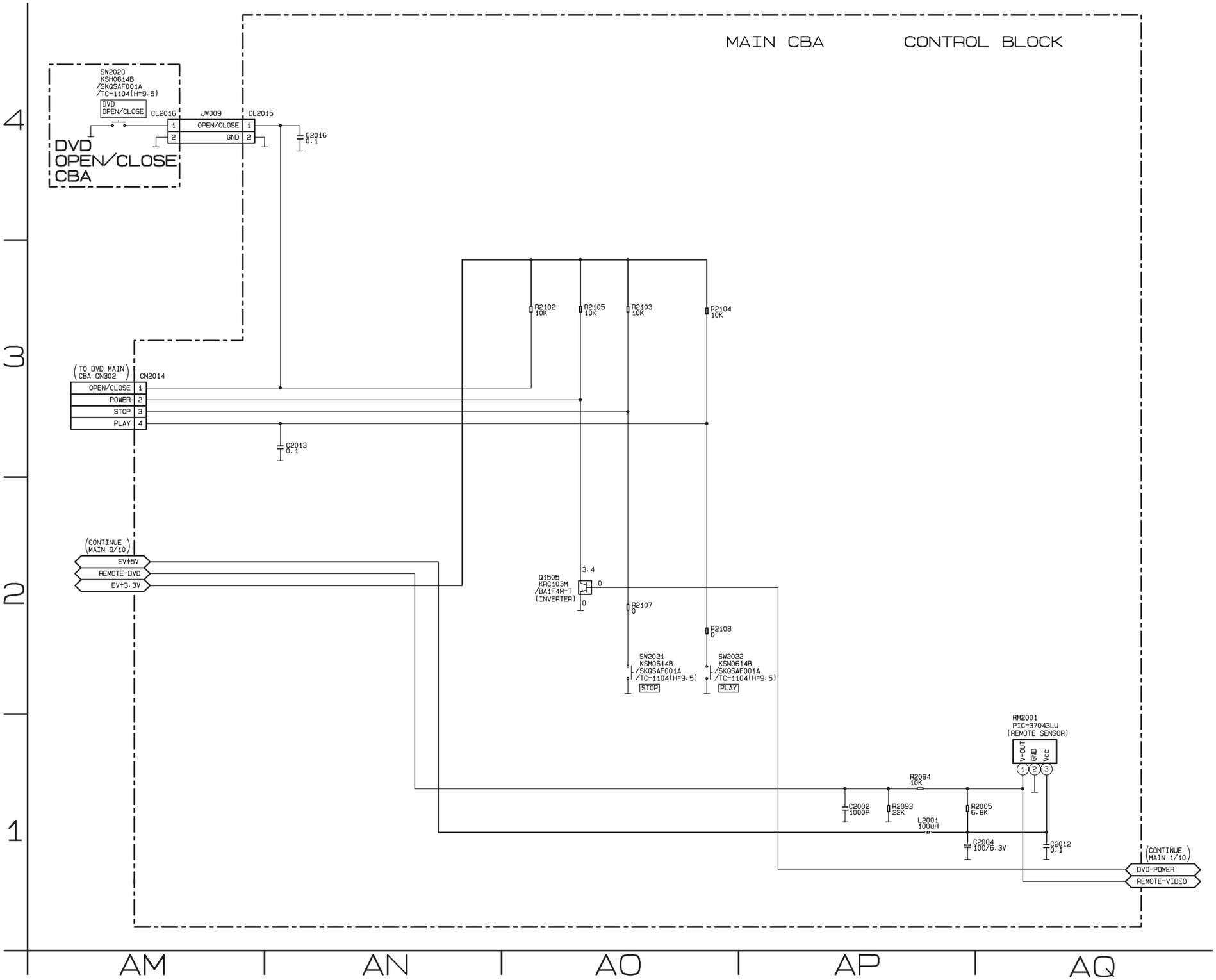
## 3-6 Main 6/10 Schematic Diagram



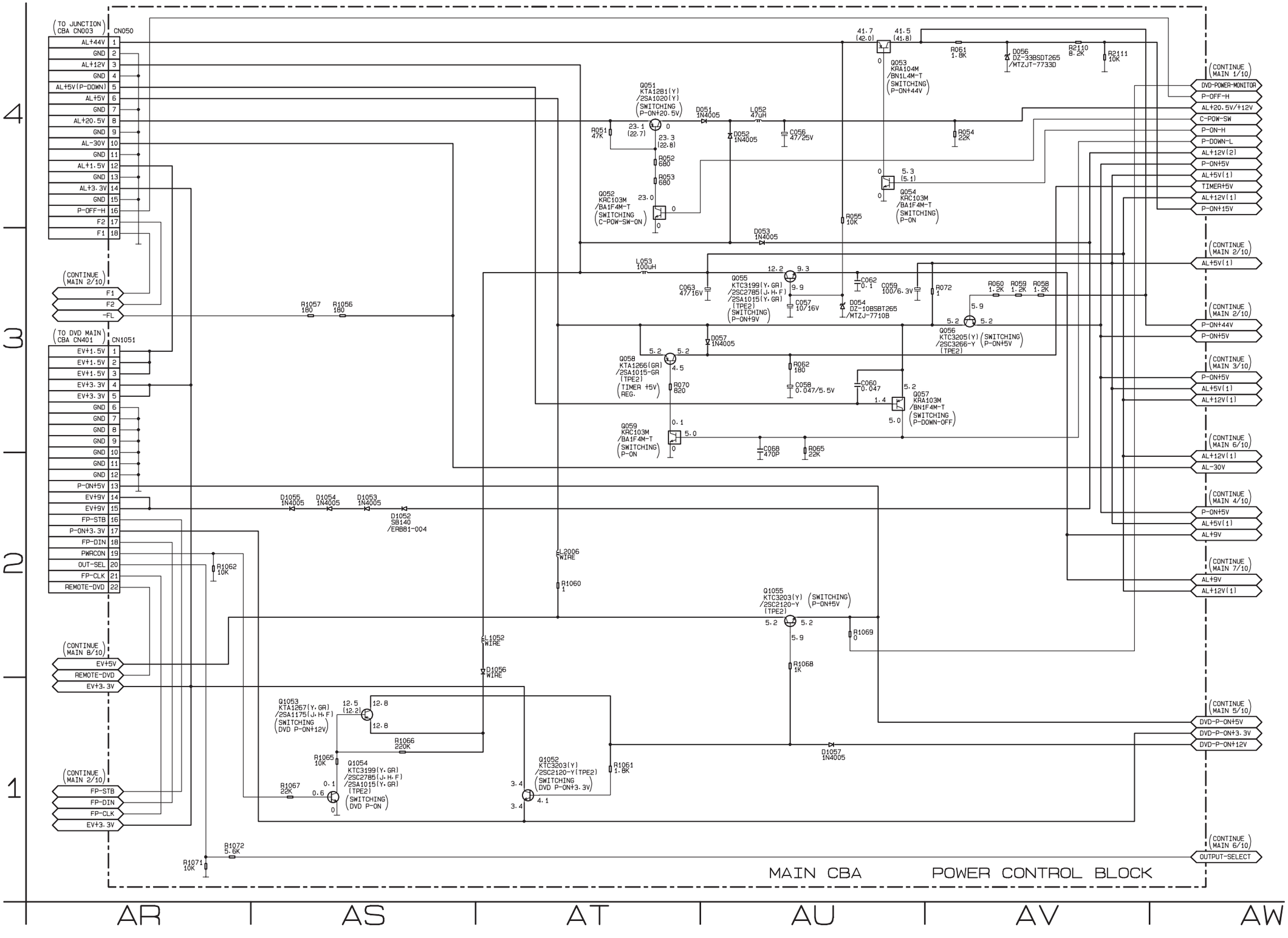
# 3-7 Main 7/10 Schematic Diagrams



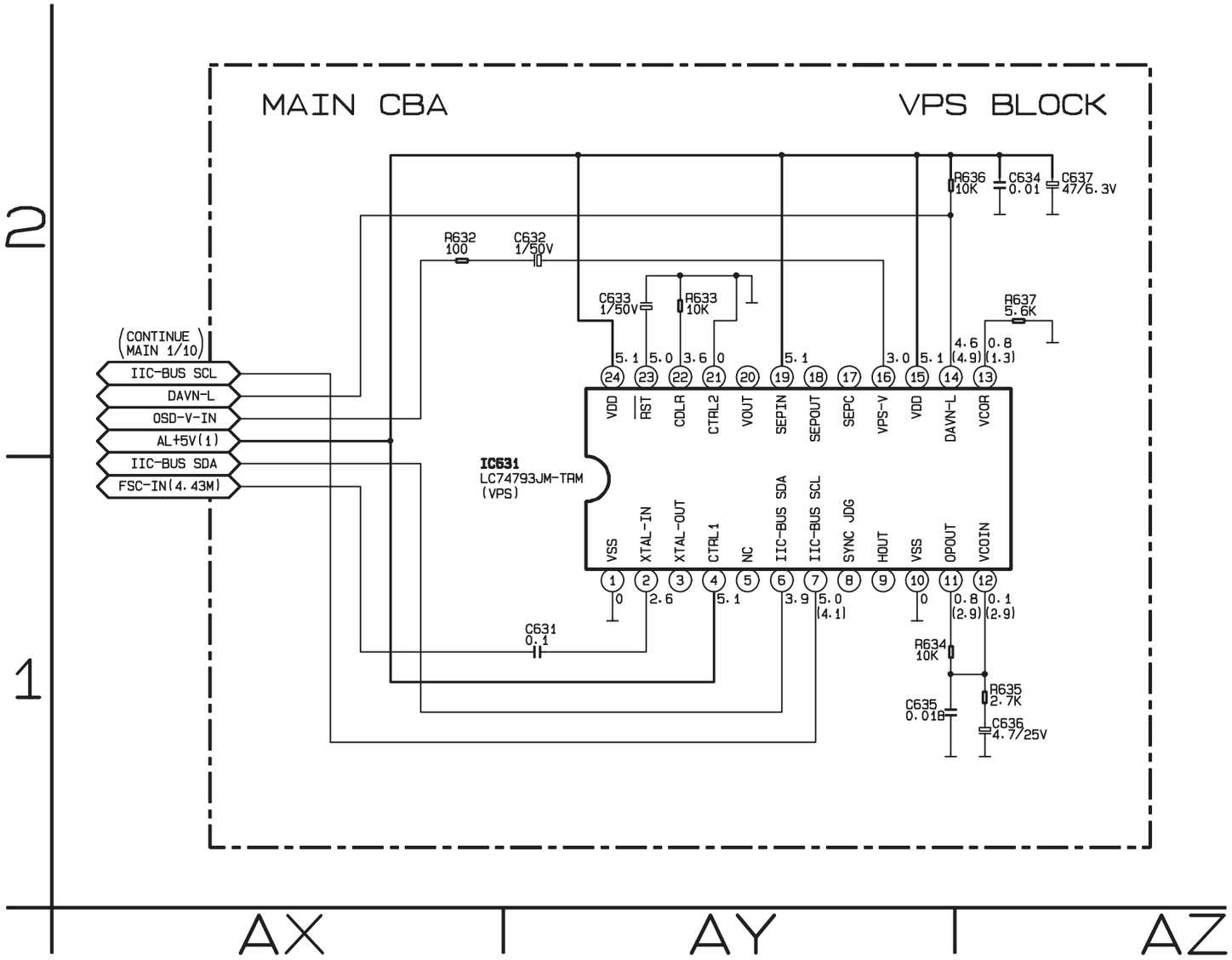
## 3-8 Main 8/10 & DVD OPEN/ CLOSE Schematic Diagram



# 3-9 Main 9/10 Schematic Diagrams



## 3-10 Main 10/10 Schematic Diagram

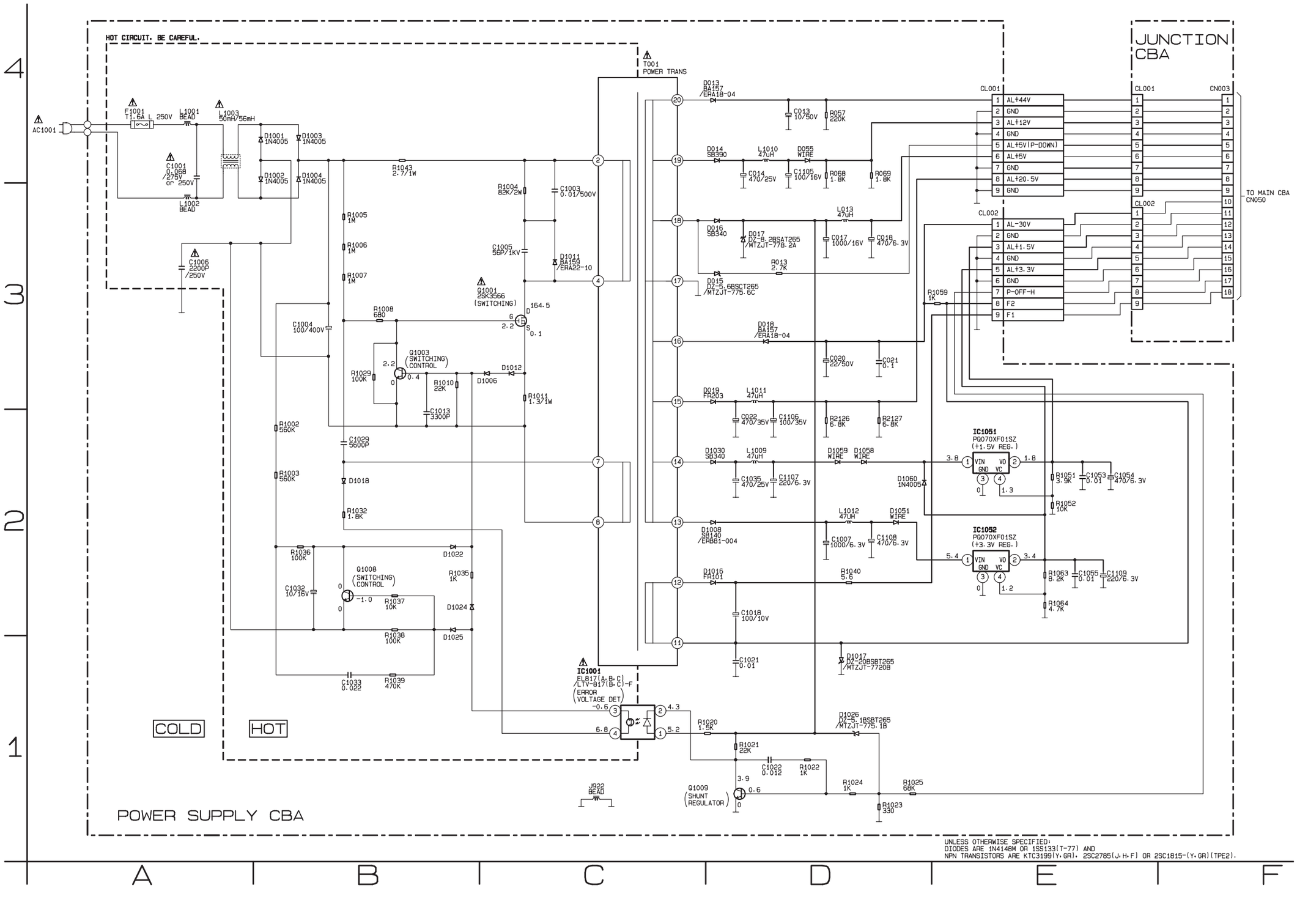


# 3-11 Power Supply & Junction Schematic Diagrams

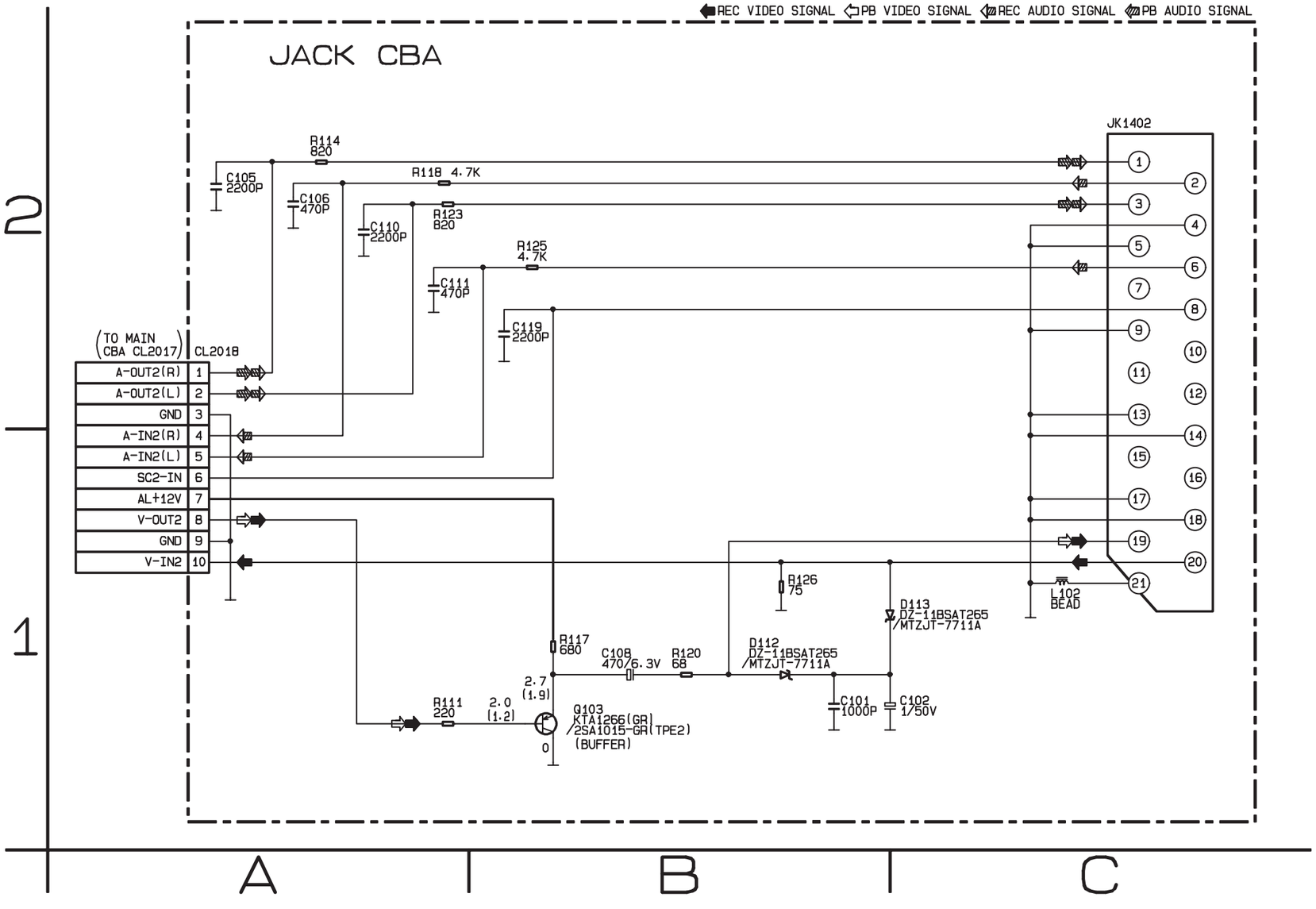
**CAUTION !**
For continued protection against fire hazard, replace only with the same type fuse.

**NOTE :**
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

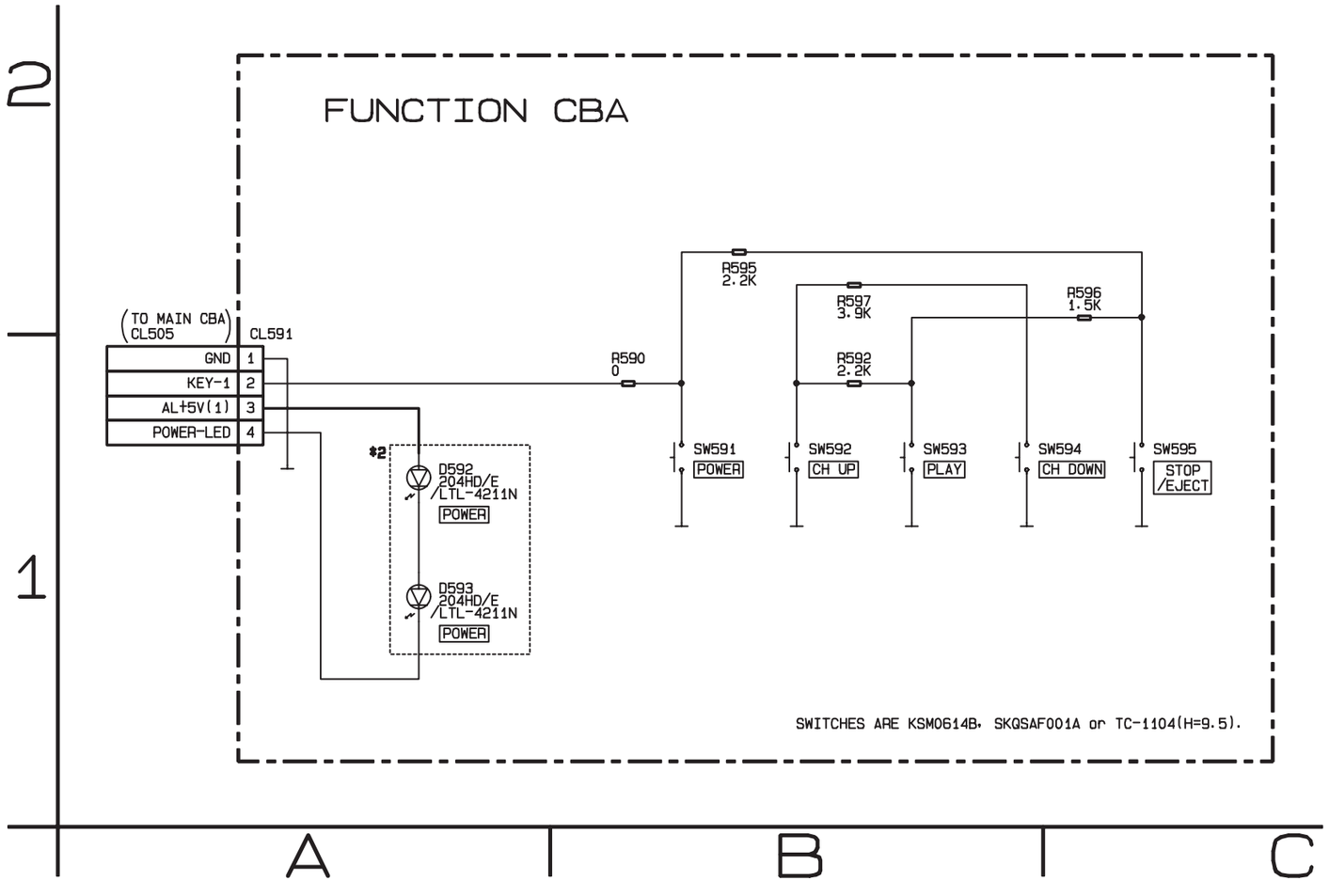
**CAUTION !**
Fixed voltage ( or Auto voltage selectable ) power supply circuit is used in this unit. If Main Fuse (F1001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.



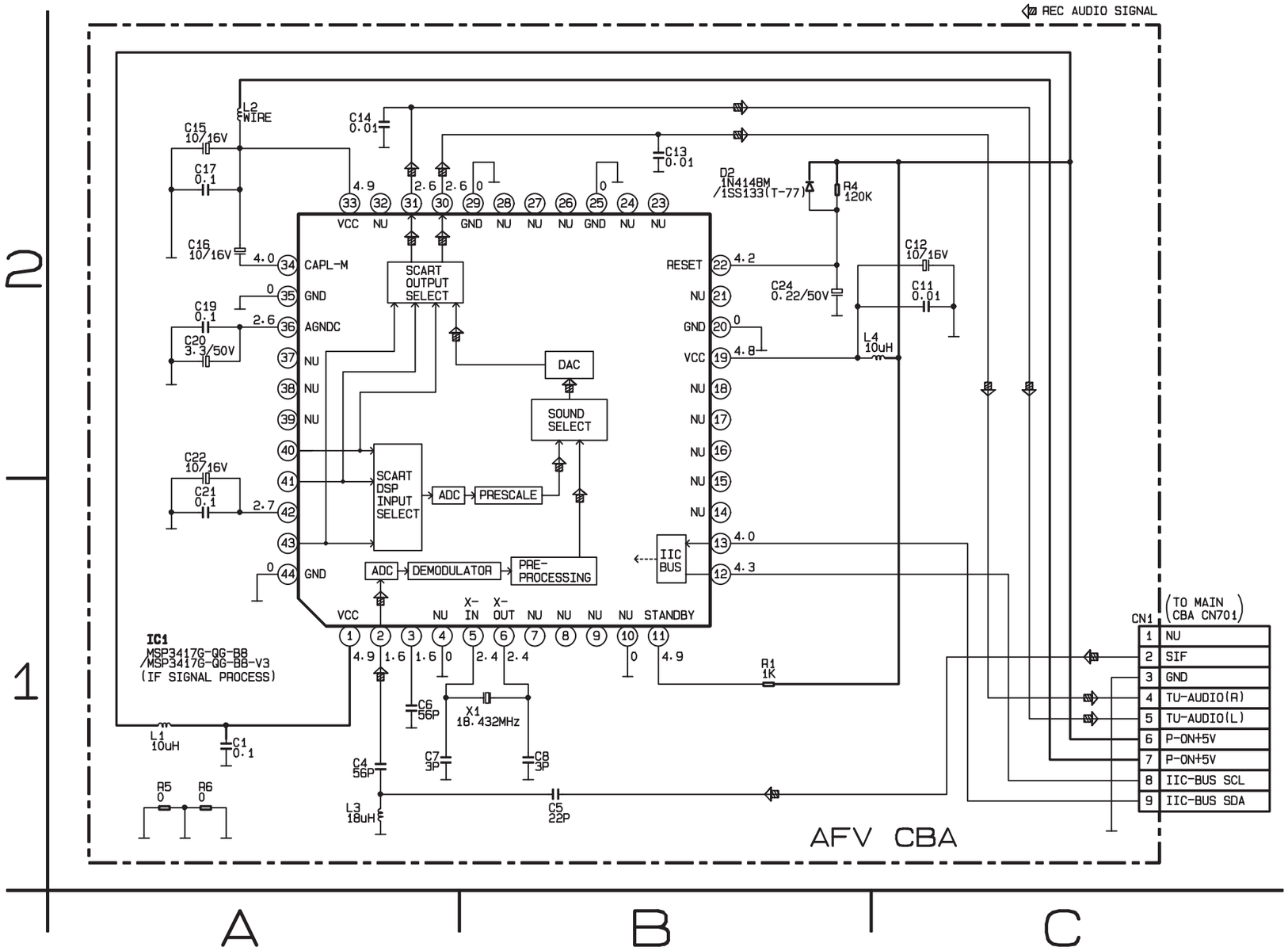
## 3-12 Jack Schematic Diagram



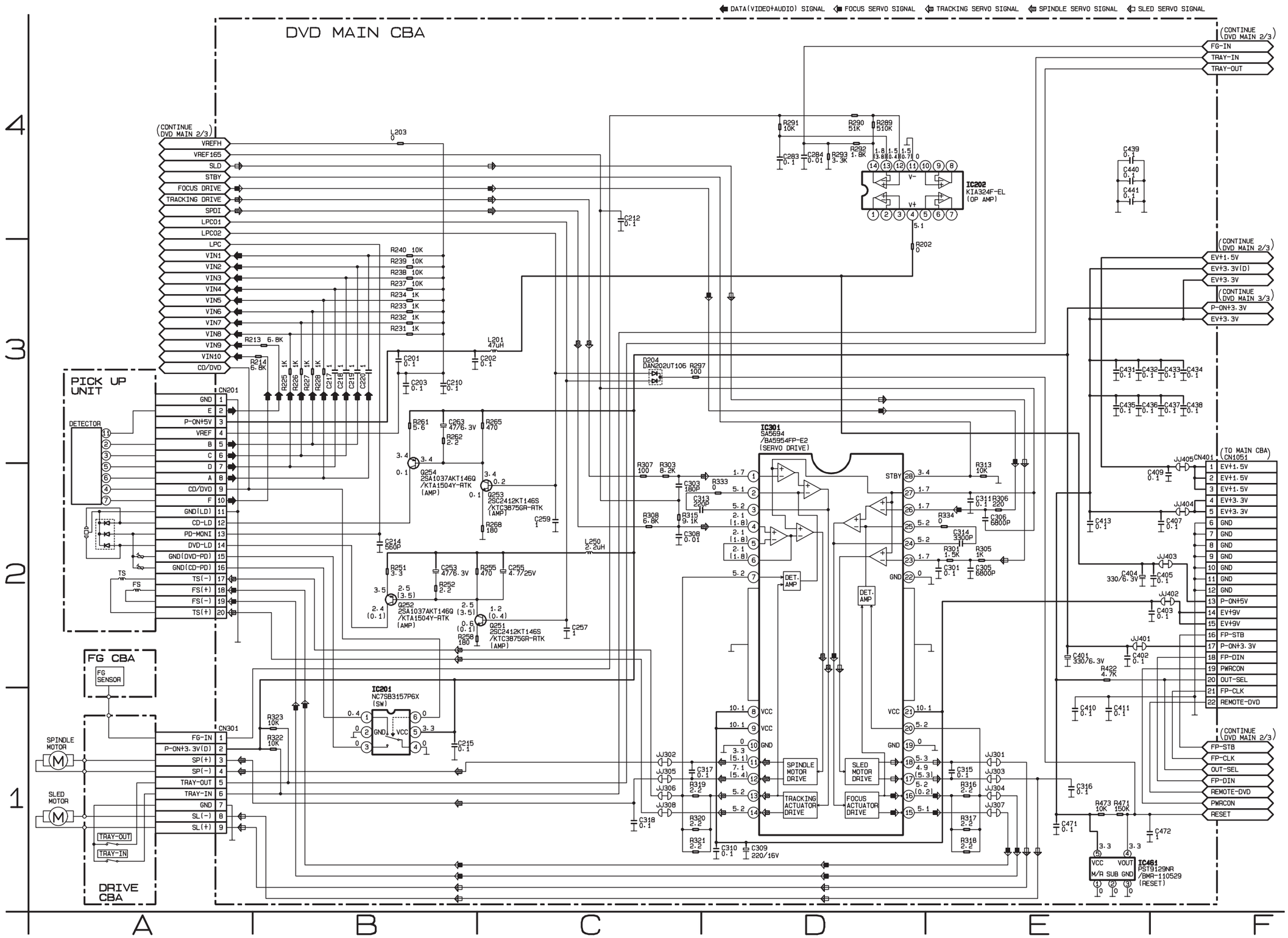
*2 **Note:**
When it is necessary to replace one or more of the following Diodes, all one should be replaced: D592, D593.



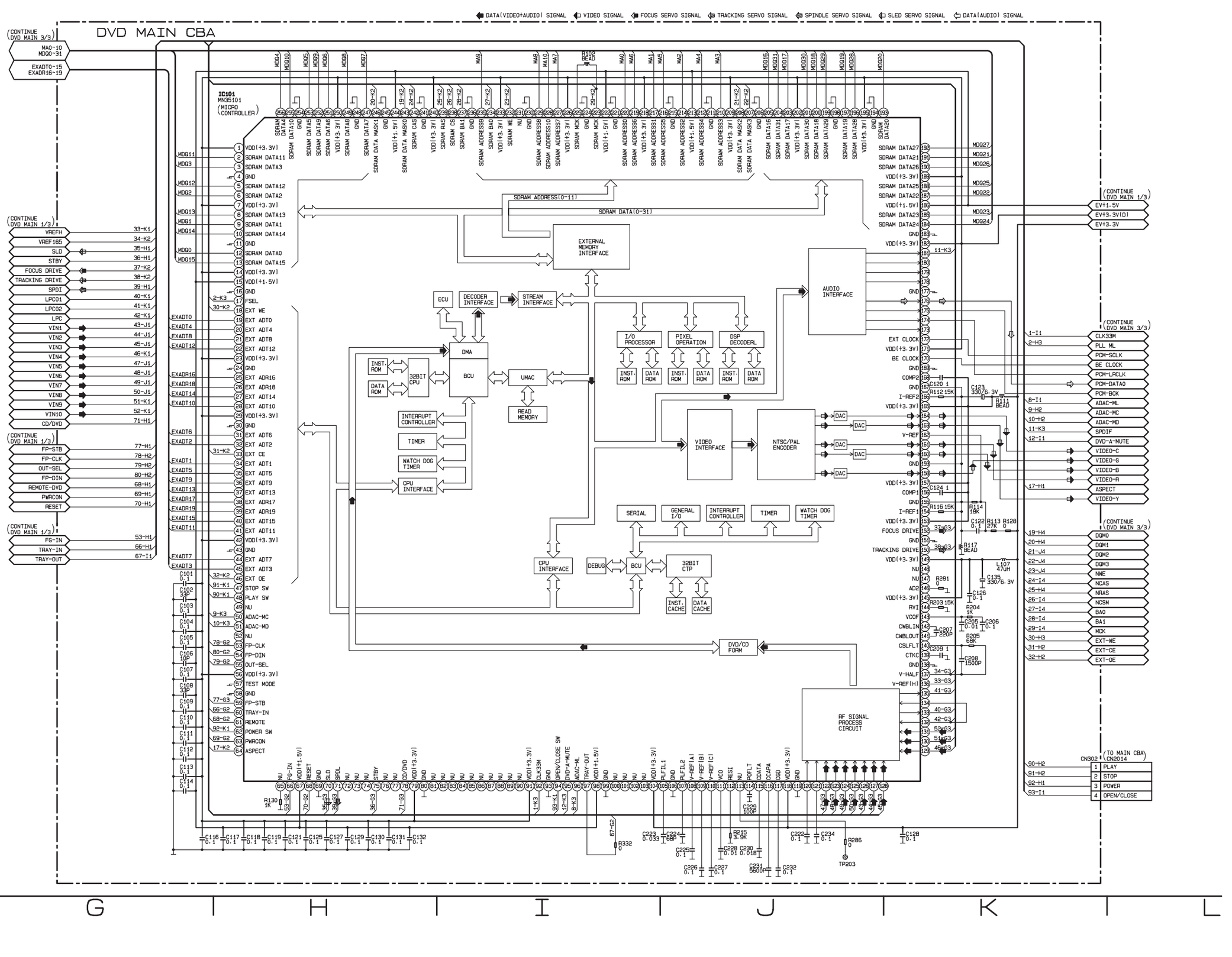
## 3-14 AFV Schematic Diagram



## 3-15 DVD Main 1/3 Schematic Diagram



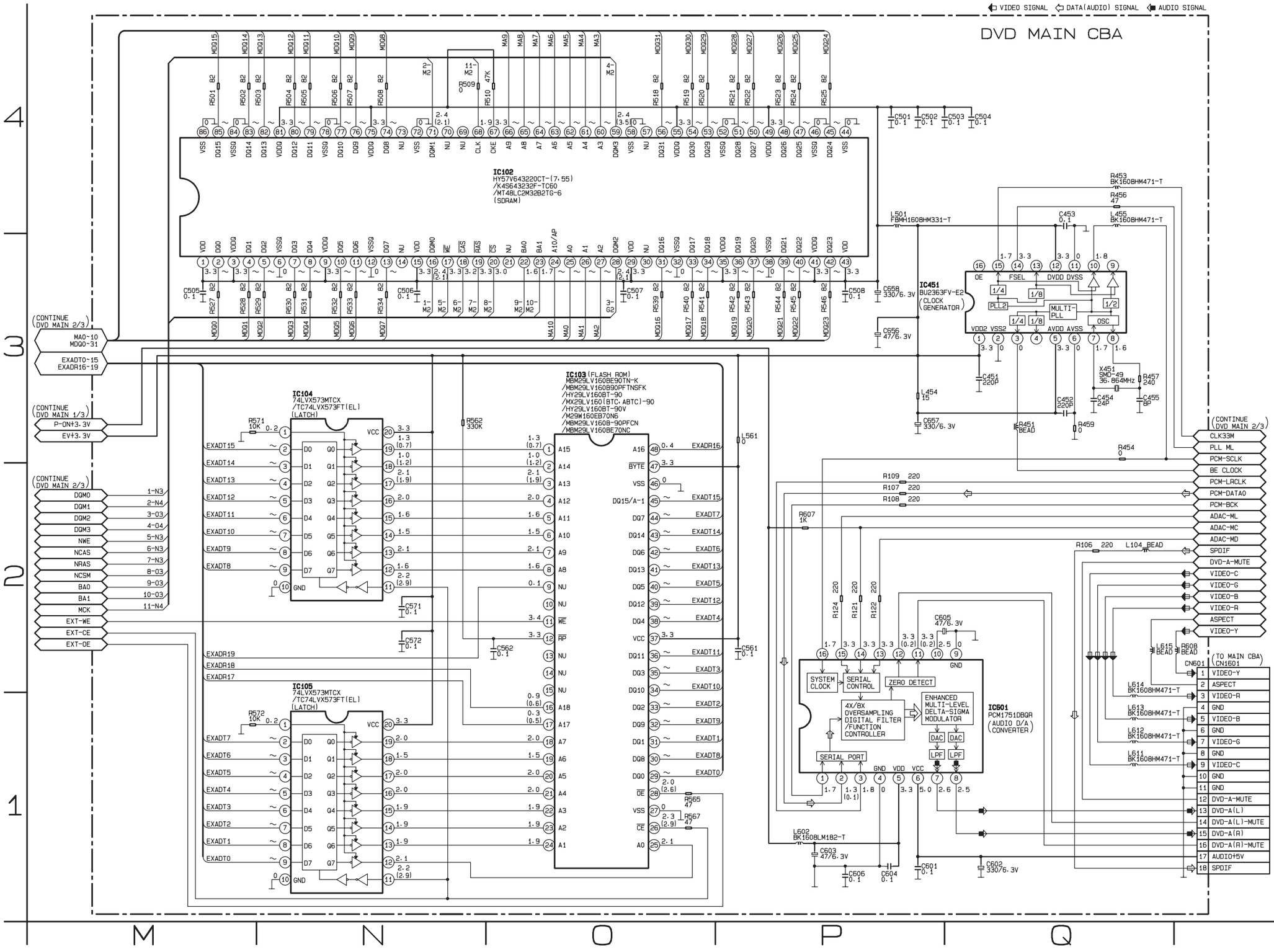
# 3-16 DVD Main 2/3 Schematic Diagram



## IC101 VOLTAGE CHART

| PIN.NO | PLAY | STOP | PIN.NO | PLAY | STOP | PIN.NO | PLAY | STOP | PIN.NO | PLAY | STOP | PIN.NO | PLAY | STOP | PIN.NO | PLAY | STOP | PIN.NO | PLAY | STOP | PIN.NO | PLAY | STOP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3.3 | 3.3 | 33 | 2.2 | 2.9 | 65 | 0.1 | 0.1 | 97 | 3.4 | 3.4 | 129 | 2.0 | 2.0 | 161 | 0.5 | 0.5 | 193 | ~ | ~ | 225 | 1.9 | 1.9 |
| 2 | ~ | ~ | 34 | ~ | ~ | 66 | 1.2 | 2.5 | 98 | 1.6 | 1.6 | 130 | 2.2 | 2.2 | 162 | 1.4 | 1.4 | 194 | 0 | 0 | 226 | 3.3 | 3.3 |
| 3 | ~ | ~ | 35 | ~ | ~ | 67 | 1.6 | 1.6 | 99 | 0 | 0 | 131 | 2.3 | 2.3 | 163 | ----- | ----- | 195 | 3.3 | 3.3 | 227 | ~ | ~ |
| 4 | 0 | 0 | 36 | ~ | ~ | 68 | 3.4 | 3.4 | 100 | ----- | ----- | 132 | 0.4 | 0.1 | 164 | 0.9 | 0.9 | 196 | ~ | ~ | 228 | ~ | ~ |
| 5 | ~ | ~ | 37 | ~ | ~ | 69 | 0 | 0 | 101 | ----- | ----- | 133 | 1.2 | 0.4 | 165 | 3.3 | 3.3 | 197 | ~ | ~ | 229 | ~ | ~ |
| 6 | ~ | ~ | 38 | 0.3 | 0.5 | 70 | 1.7 | 1.7 | 102 | ----- | ----- | 134 | 0.4 | 0.1 | 166 | 1.5 | 1.5 | 198 | 0 | 0 | 230 | 0 | 0 |
| 7 | 3.3 | 3.3 | 39 | 0.1 | 0.1 | 71 | 2.4 | 1.7 | 103 | ----- | ----- | 135 | 0.2 | 0.2 | 167 | 0 | 0 | 199 | ~ | ~ | 231 | ----- | ----- |
| 8 | ~ | ~ | 40 | ~ | ~ | 72 | ----- | ----- | 104 | 3.3 | 3.3 | 136 | 2.3 | 2.3 | 168 | 2.1 | 2.1 | 200 | ~ | ~ | 232 | 3.3 | 3.3 |
| 9 | ~ | ~ | 41 | ~ | ~ | 73 | ----- | ----- | 105 | 0.9 | 0.9 | 137 | 1.7 | 1.7 | 169 | 0 | 0 | 201 | ~ | ~ | 233 | 3.3 | 3.3 |
| 10 | ~ | ~ | 42 | 3.3 | 3.3 | 74 | ----- | ----- | 106 | 0 | 0 | 138 | 0 | 0 | 170 | 0.8 | 0.8 | 202 | 3.3 | 3.3 | 234 | 1.6 | 1.6 |
| 11 | 0 | 0 | 43 | 0 | 0 | 75 | 3.4 | 3.4 | 107 | 0.8 | 0.8 | 139 | 1.7 | 1.7 | 171 | 3.3 | 3.3 | 203 | ~ | ~ | 235 | ~ | ~ |
| 12 | ~ | ~ | 44 | ~ | ~ | 76 | ----- | ----- | 108 | 1.6 | 1.6 | 140 | 1.7 | 1.7 | 172 | 1.6 | 1.6 | 204 | ~ | ~ | 236 | 0 | 0 |
| 13 | ~ | ~ | 45 | ~ | ~ | 77 | ----- | ----- | 109 | 2.1 | 2.1 | 141 | 1.7 | 1.7 | 173 | ----- | ----- | 205 | ~ | ~ | 237 | 1.7 | 1.7 |
| 14 | 3.3 | 3.3 | 46 | 2.0 | 2.6 | 78 | 0.1 | 0.1 | 110 | 2.6 | 2.6 | 142 | 1.7 | 1.7 | 174 | 1.8 | 1.8 | 206 | 0 | 0 | 238 | 3.0 | 3.0 |
| 15 | 1.5 | 1.5 | 47 | 3.3 | 3.4 | 79 | 3.3 | 3.3 | 111 | 2.0 | 2.0 | 143 | 0.5 | 0.5 | 175 | 1.7 | 1.7 | 207 | 2.4 | 3.5 | 239 | 3.3 | 3.3 |
| 16 | 0 | 0 | 48 | 3.2 | 3.4 | 80 | 0 | 0 | 112 | 0.7 | 0.9 | 144 | 1.6 | 1.6 | 176 | 1.4 | 0.1 | 208 | 2.4 | 2.1 | 240 | 3.3 | 3.3 |
| 17 | 3.4 | 3.4 | 49 | ----- | ----- | 81 | ----- | ----- | 113 | 0 | 0 | 145 | 3.3 | 3.3 | 177 | 0 | 0 | 209 | 3.3 | 3.3 | 241 | 0 | 0 |
| 18 | 3.4 | 3.4 | 50 | 3.4 | 3.4 | 82 | ----- | ----- | 114 | 1.8 | 1.8 | 146 | 0 | 0 | 178 | ----- | ----- | 210 | ~ | ~ | 242 | 3.2 | 3.2 |
| 19 | ~ | ~ | 51 | 3.4 | 3.4 | 83 | ----- | ----- | 115 | 1.4 | 1.4 | 147 | ----- | ----- | 179 | ----- | ----- | 211 | 0 | 0 | 243 | 2.4 | 2.1 |
| 20 | ~ | ~ | 52 | ----- | ----- | 84 | ----- | ----- | 116 | 0.3 | 0.3 | 148 | ----- | ----- | 180 | ----- | ----- | 212 | ~ | ~ | 244 | 1.5 | 1.5 |
| 21 | ~ | ~ | 53 | 3.4 | 3.4 | 85 | ----- | ----- | 117 | 1.6 | 1.6 | 149 | 3.3 | 3.3 | 181 | 1.7 | 1.7 | 213 | 1.5 | 1.5 | 245 | 0 | 0 |
| 22 | ~ | ~ | 54 | 3.4 | 3.4 | 86 | ----- | ----- | 118 | 3.3 | 3.3 | 150 | 1.7 | 1.7 | 182 | 3.3 | 3.3 | 214 | ~ | ~ | 246 | 2.4 | 2.1 |
| 23 | 3.3 | 3.3 | 55 | 3.3 | 3.3 | 87 | ----- | ----- | 119 | 0 | 0 | 151 | 0 | 0 | 183 | 0 | 0 | 215 | 0 | 0 | 247 | ~ | ~ |
| 24 | 0 | 0 | 56 | 3.3 | 3.3 | 88 | ----- | ----- | 120 | 1.9 | 1.9 | 152 | 1.7 | 1.7 | 184 | ~ | ~ | 216 | ~ | ~ | 248 | 0 | 0 |
| 25 | 0.4 | 0.4 | 57 | 0 | 0 | 89 | ----- | ----- | 121 | 1.9 | 1.9 | 153 | 3.3 | 3.3 | 185 | ~ | ~ | 217 | ~ | ~ | 249 | ~ | ~ |
| 26 | 0.9 | 0.6 | 58 | 0 | 0 | 90 | ----- | ----- | 122 | 2.4 | 2.4 | 154 | 1.4 | 1.4 | 186 | 1.5 | 1.5 | 218 | 3.3 | 3.3 | 250 | 3.3 | 3.3 |
| 27 | ~ | ~ | 59 | 3.3 | 3.3 | 91 | 3.3 | 3.3 | 123 | 2.4 | 2.4 | 155 | 0 | 0 | 187 | ~ | ~ | 219 | ~ | ~ | 251 | ~ | ~ |
| 28 | ~ | ~ | 60 | 3.4 | 3.4 | 92 | 1.7 | 1.5 | 124 | 2.4 | 2.4 | 156 | 2.2 | 2.2 | 188 | ~ | ~ | 220 | ~ | ~ | 252 | ~ | ~ |
| 29 | 3.3 | 3.3 | 61 | 3.1 | 3.1 | 93 | 0 | 0 | 125 | 2.4 | 2.4 | 157 | 3.3 | 3.3 | 189 | 3.3 | 3.3 | 221 | 0 | 0 | 253 | ~ | ~ |
| 30 | 0 | 0 | 62 | 3.2 | 3.4 | 94 | ----- | ----- | 126 | 2.0 | 2.0 | 158 | 0.7 | 0.7 | 190 | ~ | ~ | 222 | 1.5 | 1.5 | 254 | 0 | 0 |
| 31 | ~ | ~ | 63 | 3.4 | 3.4 | 95 | 3.4 | 0.1 | 127 | 2.0 | 2.0 | 159 | 0 | 0 | 191 | ~ | ~ | 223 | 1.9 | 1.9 | 255 | ~ | ~ |
| 32 | ~ | ~ | 64 | 0.8 | 0.8 | 96 | 3.4 | 3.4 | 128 | 2.0 | 2.0 | 160 | 0.5 | 0.5 | 192 | ~ | ~ | 224 | 0 | 0 | 256 | ~ | ~ |

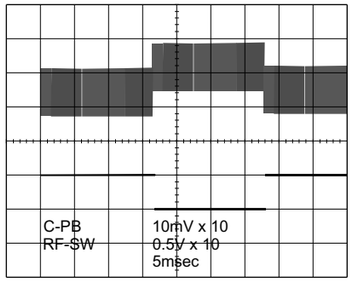
# 3-17 DVD Main 3/3 Schematic Diagram



# 4 WAVEFORMS

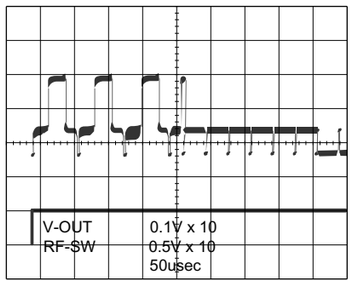
**WF2** UPPER (TP301 of Main CBA)

**WF1** LOWER (TP504 of Main CBA)

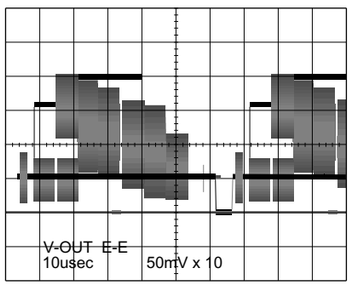



**WF3** UPPER (TP751 of Main CBA)

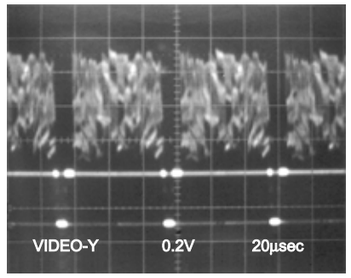
**WF1** LOWER (TP504 of Main CBA)



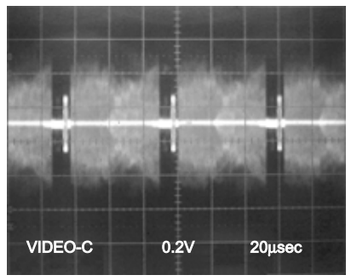

**WF3** (TP751 of Main CBA)



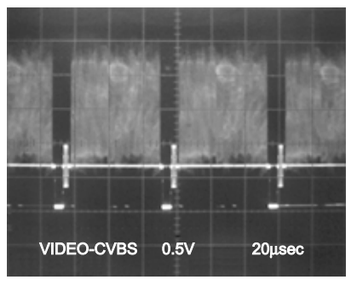

**WF4** Pin 1 of CN1601



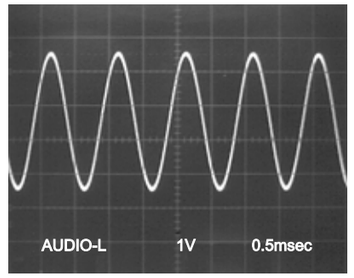

**WF5** Pin 9 of CN1601



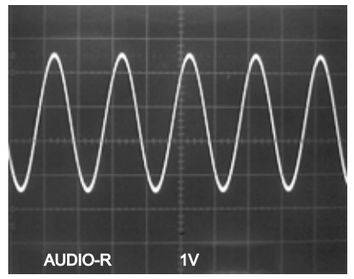

**WF6** Pin 31 of IC1402



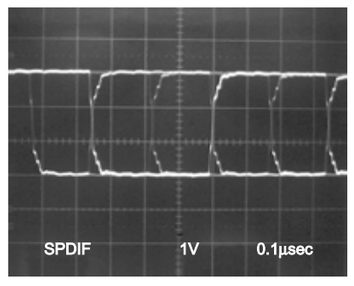

**WF7** Pin 13 of CN1601




**WF8** Pin 15 of CN1601




**WF9** Pin 18 of CN1601

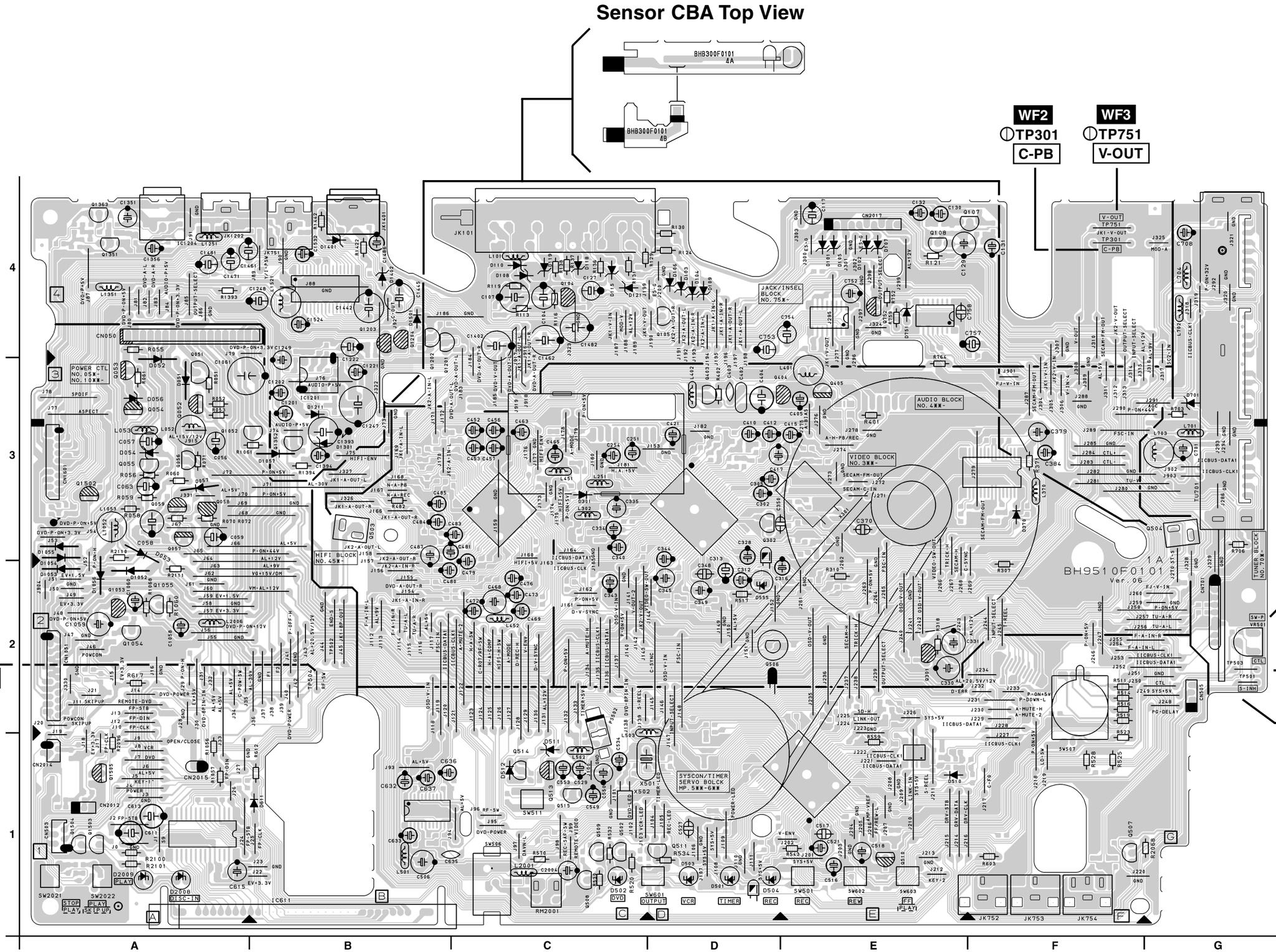



**NOTE:**
Input
CD: 1kHz PLAY
(WF7~WF9)
DVD: POWER ON (STOP) MODE
(WF4~WF6)

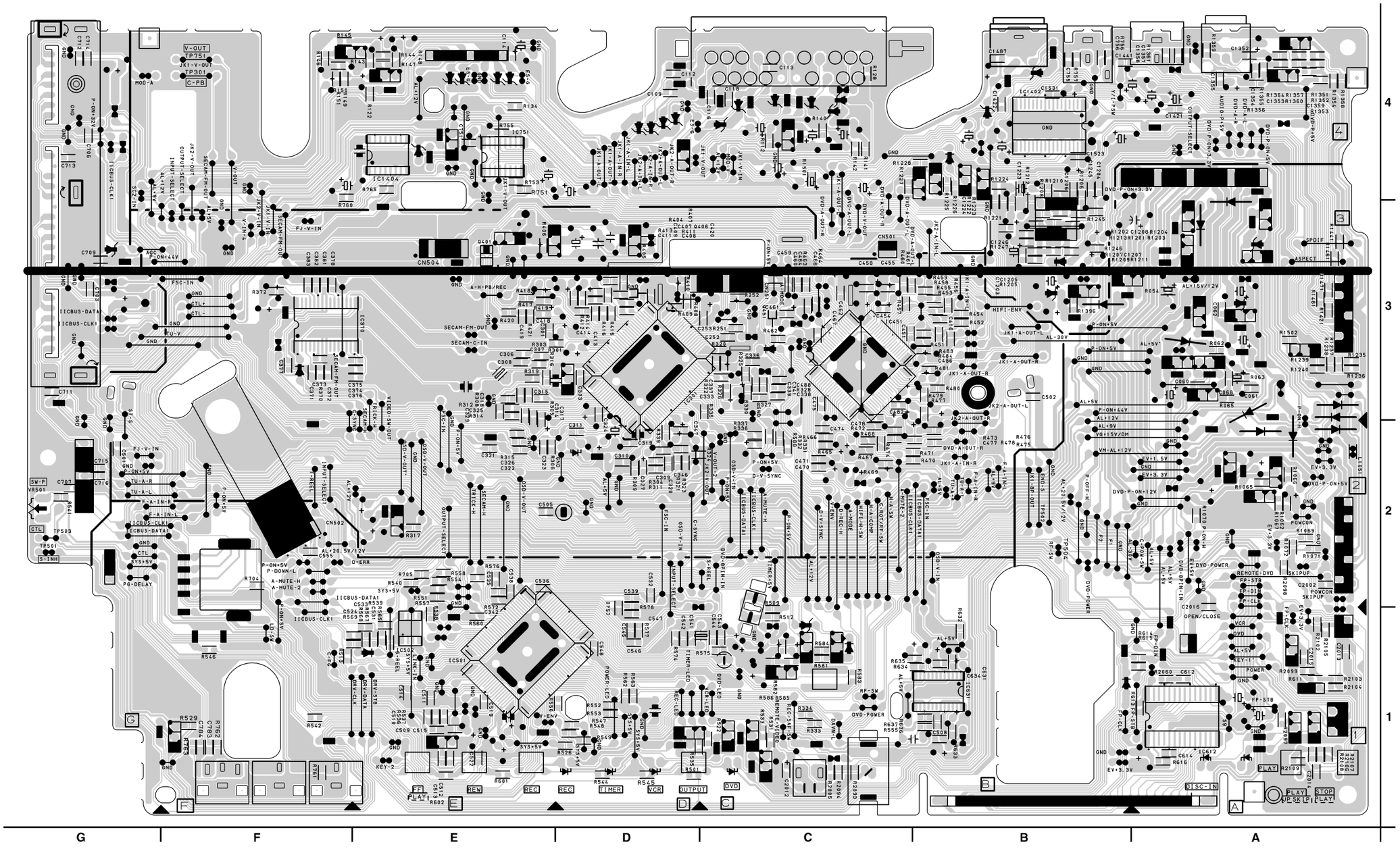
# 5 CIRCUIT BOARD DIAGRAMS

## 5-1 Main CBA Top View & Sensor CBA Top View

### Sensor CBA Top View

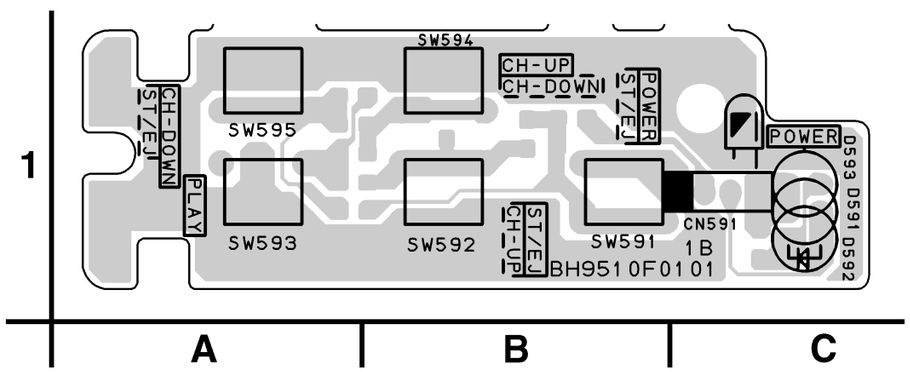


## 5-2 Main CBA Bottom View

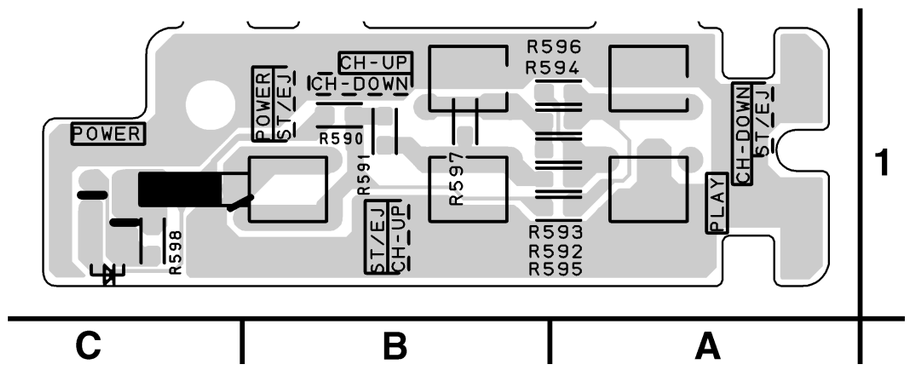


## 5-3 Function CBA Top/Bottom View & DVD OPEN/CLOSE CBA Top/Bottom View

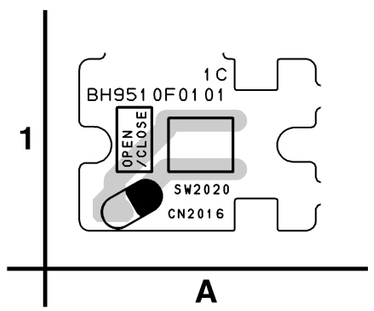
### Function CBA Top View



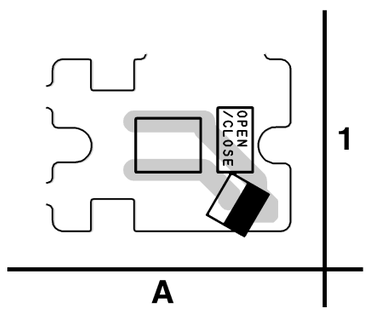

### Function CBA Bottom View




### DVD OPEN/CLOSE CBA Top View




### DVD OPEN /CLOSE CBA Bottom View



# 5-4 Power Supply CBA Top/Bottom View & Junction CBA Top/Bottom View

## Power Supply CBA Top View

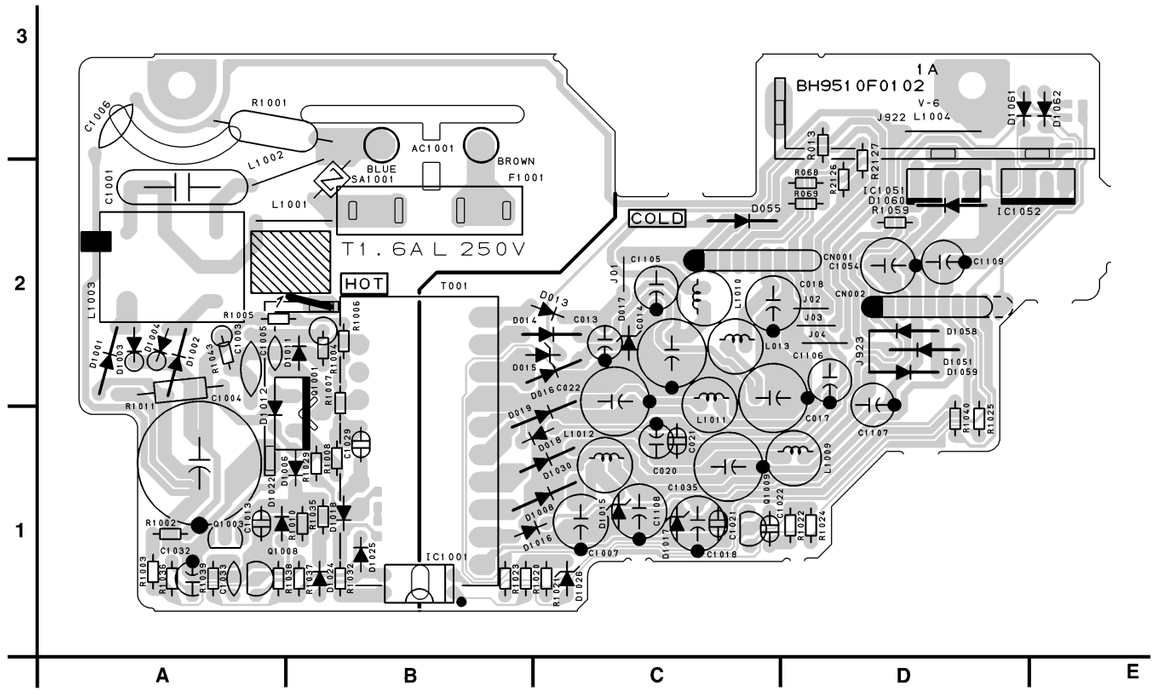
**CAUTION !**
For continued protection against fire hazard, replace only with the same type fuse.

**NOTE :**
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

**CAUTION !**
Fixed voltage ( or Auto voltage selectable ) power supply circuit is used in this unit. If Main Fuse (F1001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

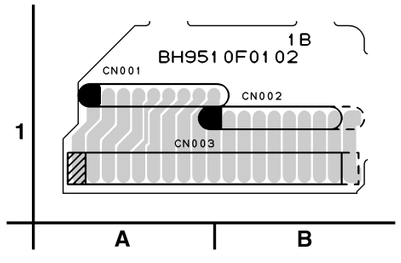
## Power Supply CBA Bottom View

**BECAUSE A HOT CHASSIS GROUND IS PRESENT IN THE POWER SUPPLY CIRCUIT , AN ISOLATION TRANSFORMER MUST BE USED. ALSO , IN ORDER TO HAVE THE ABILITY TO INCREASE THE INPUT SLOWLY , WHEN TROUBLESHOOTING THIS TYPE POWER SUPPLY CIRCUIT , A VARIABLE ISOLATION TRANSFORMER IS REQUIRED.**

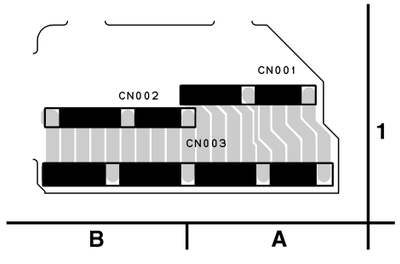




## Junction CBA Top View

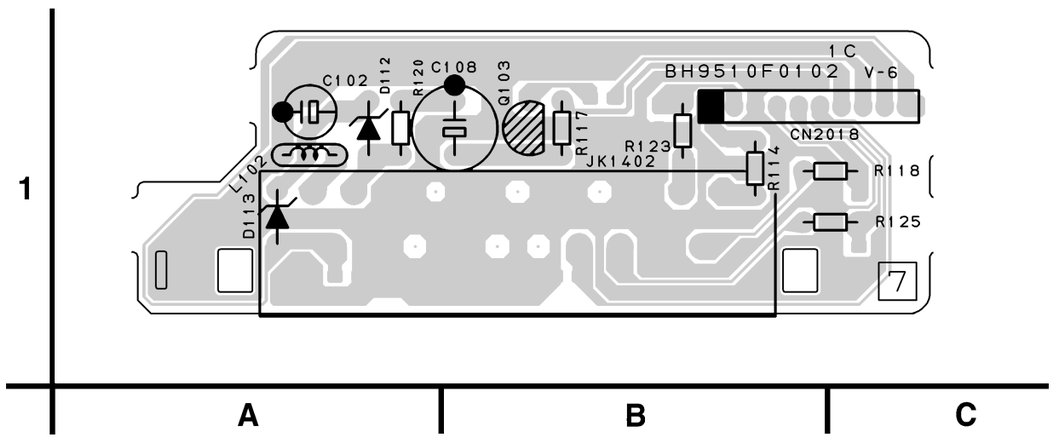



## Junction CBA Bottom View

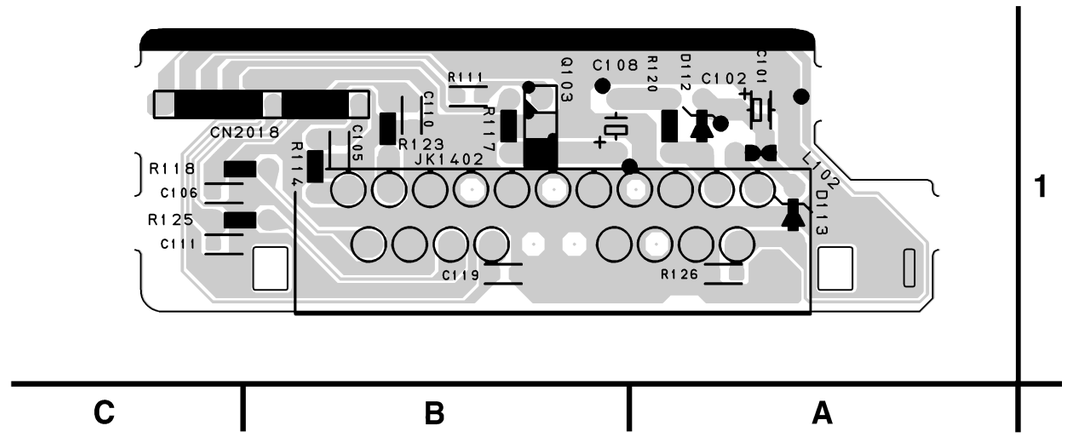


## 5-5 JACK CBA Top/Bottom View & AFV CBA  Top/Bottom View

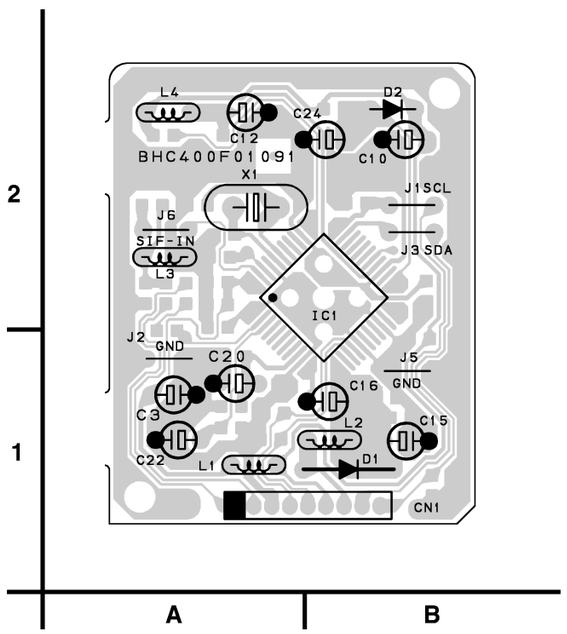
### Jack CBA Top View



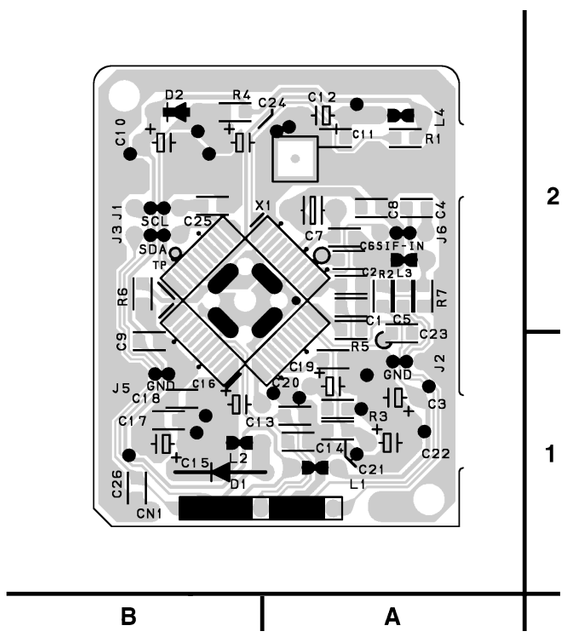

### Jack CBA Bottom View




### AFV CBA Top View

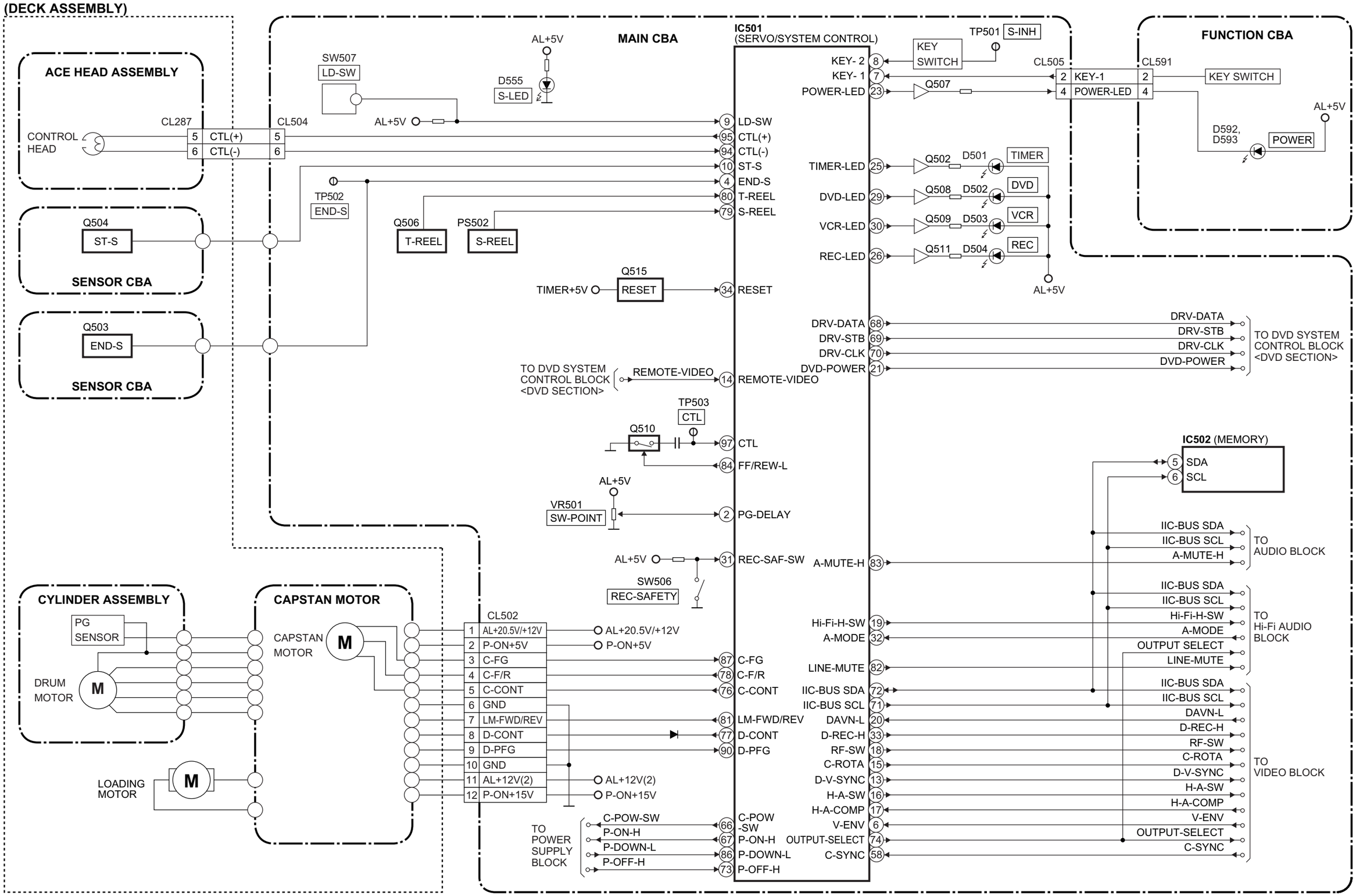



### AFV CBA Bottom View

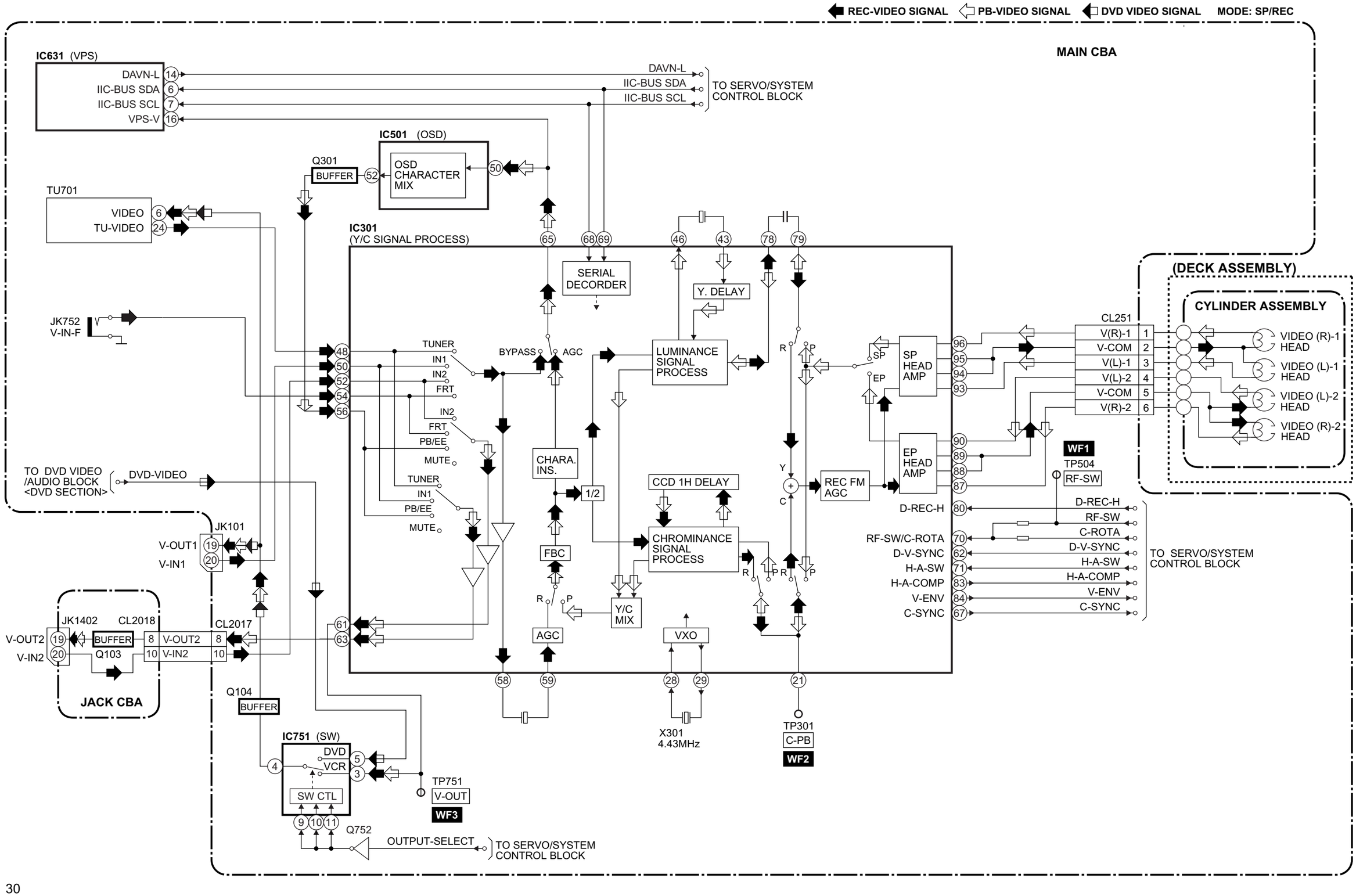


# 6 BLOCK DIAGRAMS

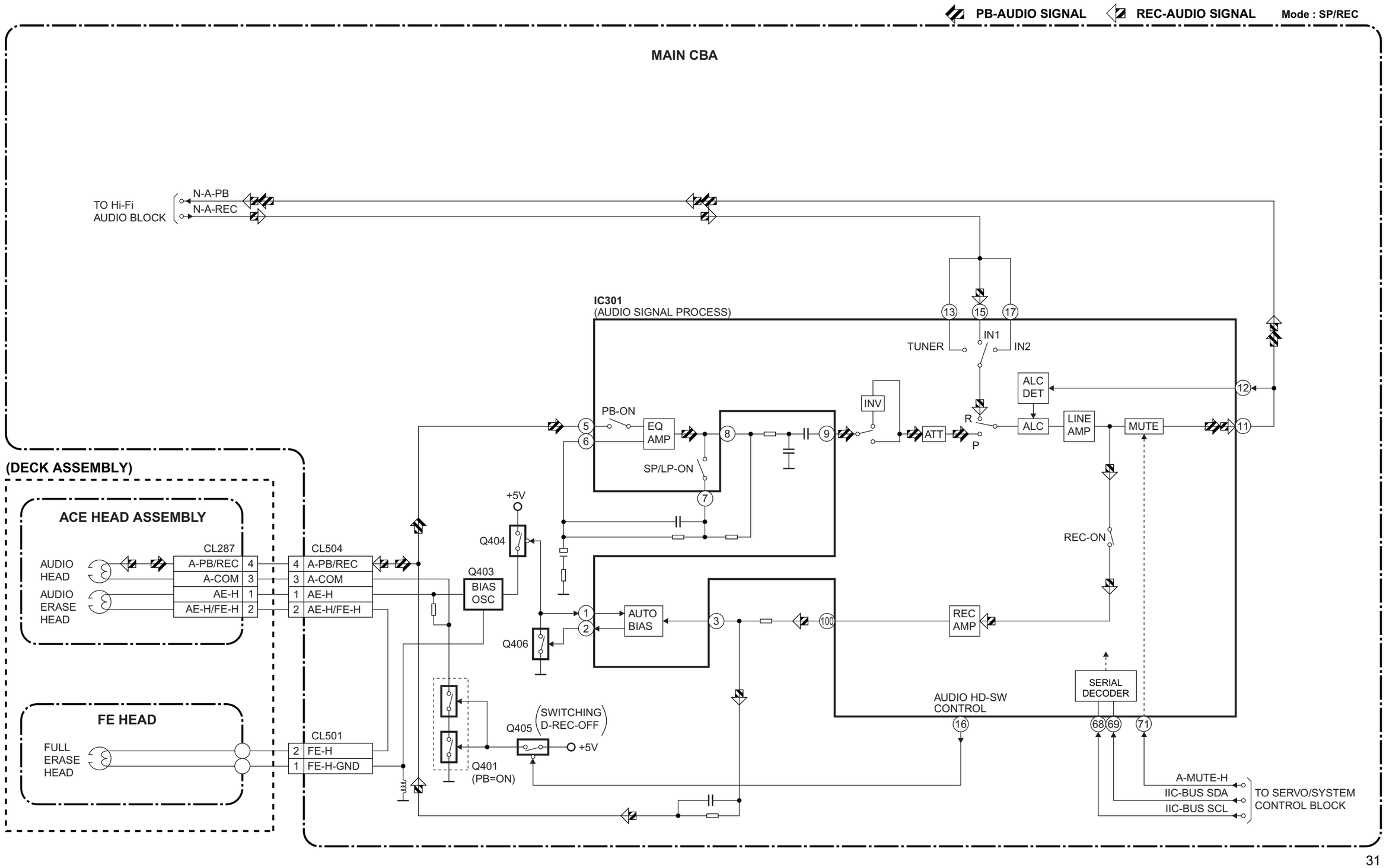
## 6-1 Servo/System Control Block Diagram



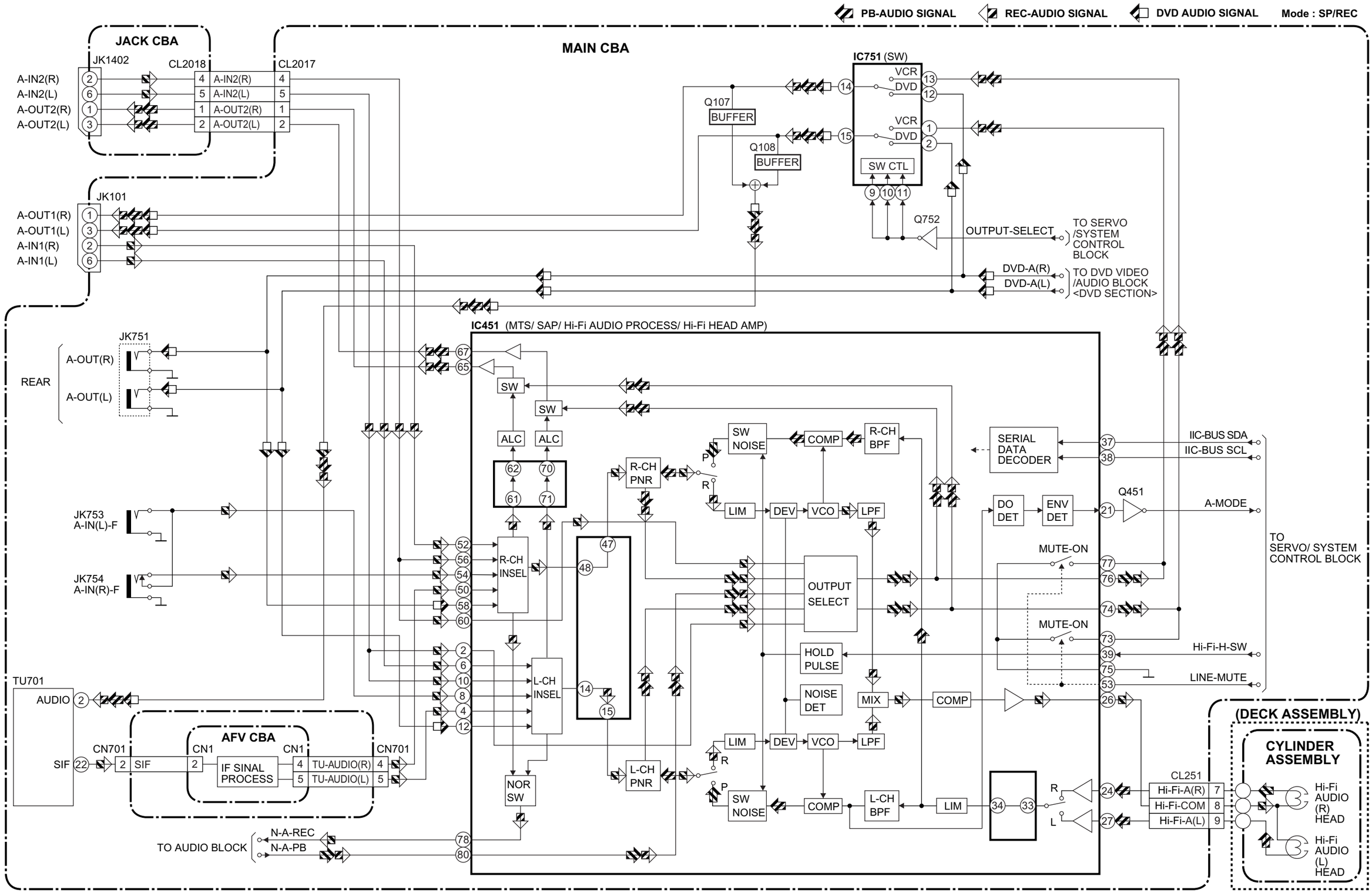
## 6-2 Video Block Diagram



## 6-3 Audio Block Diagram



## 6-4 Hi-Fi Audio Block Diagram

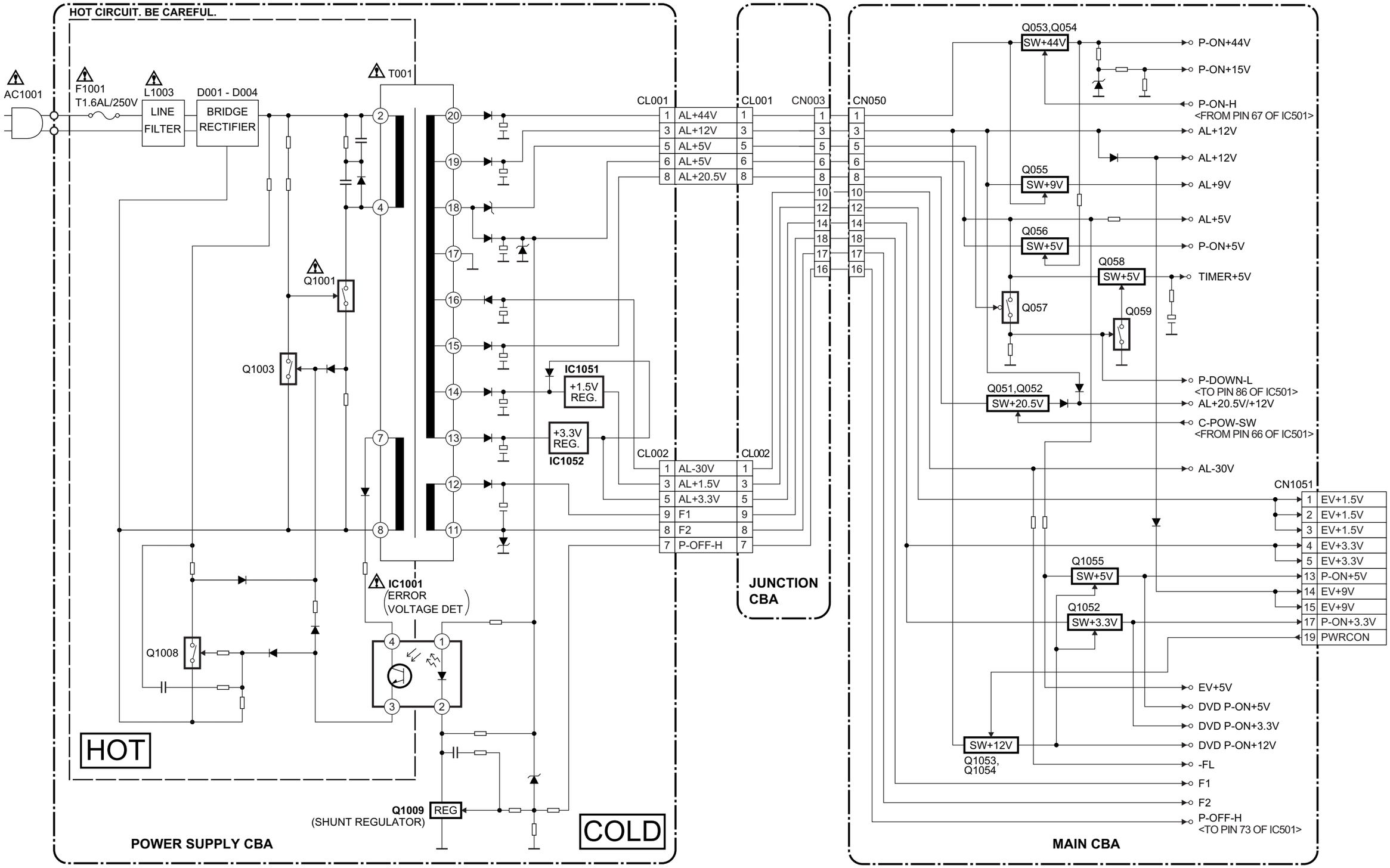


# 6-5 Power Supply Block Diagram

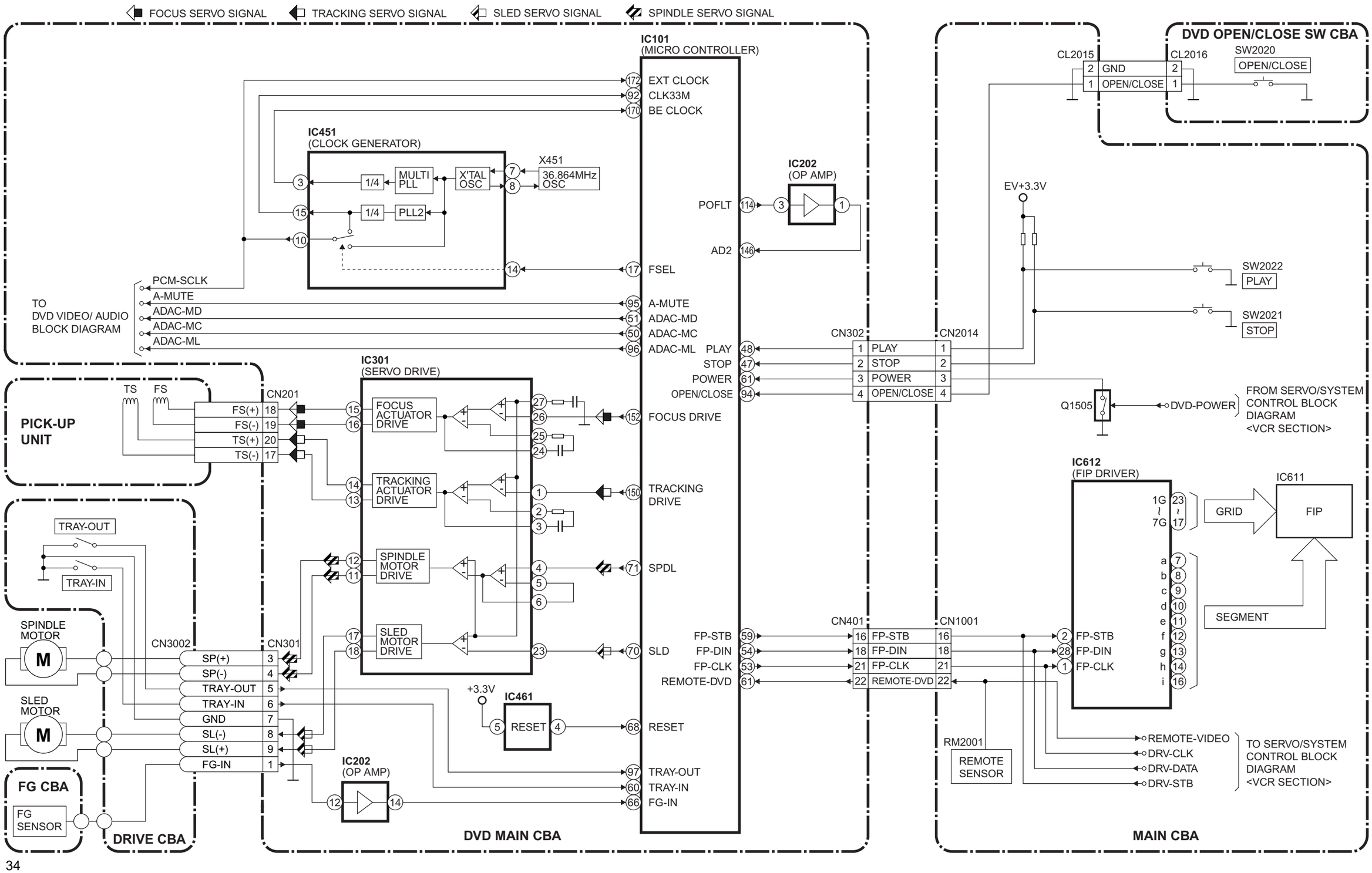
NOTE :
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

**CAUTION**
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE T1.6AL/250V FUSE.

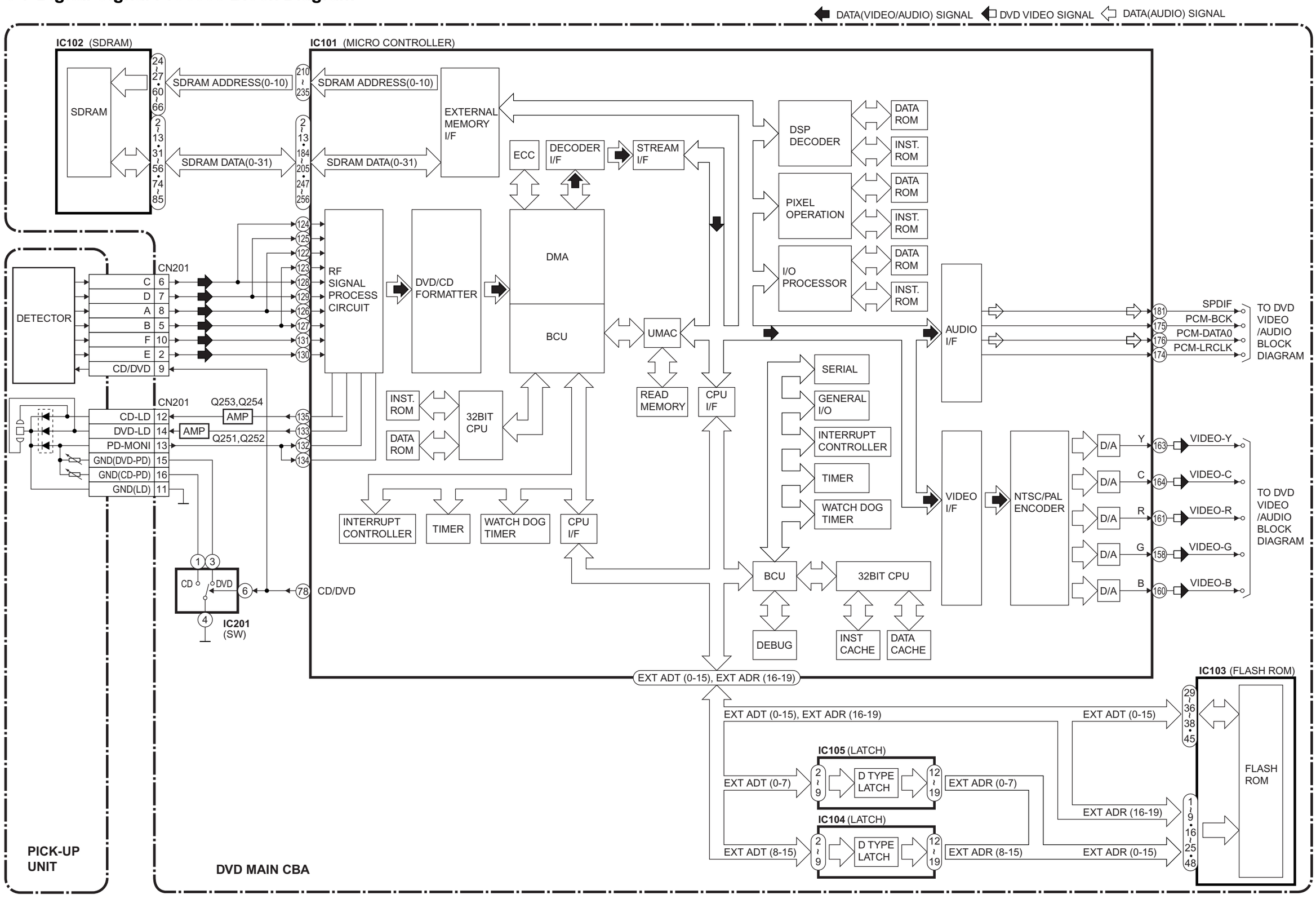
**CAUTION !**
Fixed voltage (or Auto voltage selectable ) power supply circuit is used in this unit. If Main Fuse (F001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.



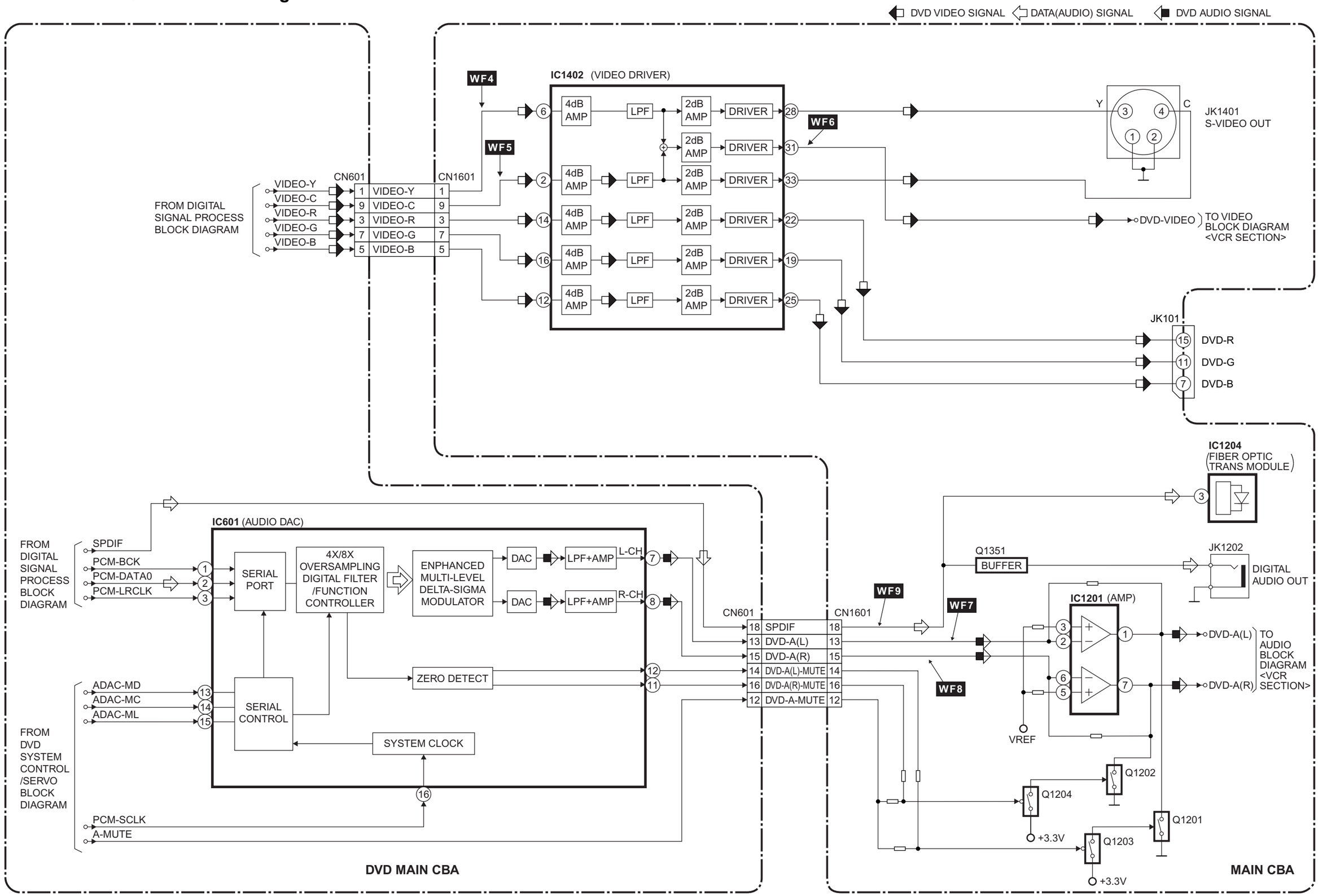
## 6-6 DVD System Control/Servo Block Diagram



## 6-7 Digital Signal Process Block Diagram



## 6-8 DVD Video / Audio Block Diagram



# 7 SYSTEM CONTROL TIMING CHARTS

## [ VCR Section ]

## Mode SW : LD-SW

| LD-SW Position detection A/D Input voltage Limit (Calculated voltage) | Symbol |
|---|---|
| 3.76V~4.50V (4.12V) | EJ |
| 4.51V~5.00V (5.00V) | CL |
| 0.00V~0.25V (0.00V) | SB |
| 1.06V~1.50V (1.21V) | TL |
| 0.66V~1.05V (0.91V) | FB |
| 1.99V~2.60V (2.17V) | SF |
| 1.51V~1.98V (1.80V) | SM |
| 3.20V~3.75V (3.40V) | AU |
| 0.26V~0.65V (0.44V) | AL |
| 4.51V~5.00V (5.00V) | SS |
| 2.61V~3.19V (2.97V) | RS |

**Note:**

**Note:**

EJ ⟶ RS: Loading FWD (LM-FWD/REV “H”)
RS ⟶ EJ: Loading REV (LM-FWD/REV “L”)
Stop (A) = Loading
Stop (B) = Unloading

**Note:**

| Symbol | Loading Status |
|---|---|
| EJ | Eject |
| CL | Eject ~ REW Reel |
| SB | REW Reel ~ Stop(B) |
| TL | Stop(B) ~ Brake Cancel |
| FB | Brake Cancel ~ FF / REW |
| SF | FF / REW ~ Stop(M), (FF / REW) |
| SM | Stop(M), (FF / REW) ~ Stop(A) |
| AU | Stop(A) ~ Play / REC |
| AL | Play / REC ~ Still / Slow |
| SS | Still / Slow ~ RS (REW Search) |
| RS | RS (REW Search) |

## Still/Slow Control
## Frame Advance Timing Chart

**1) SP Mode**

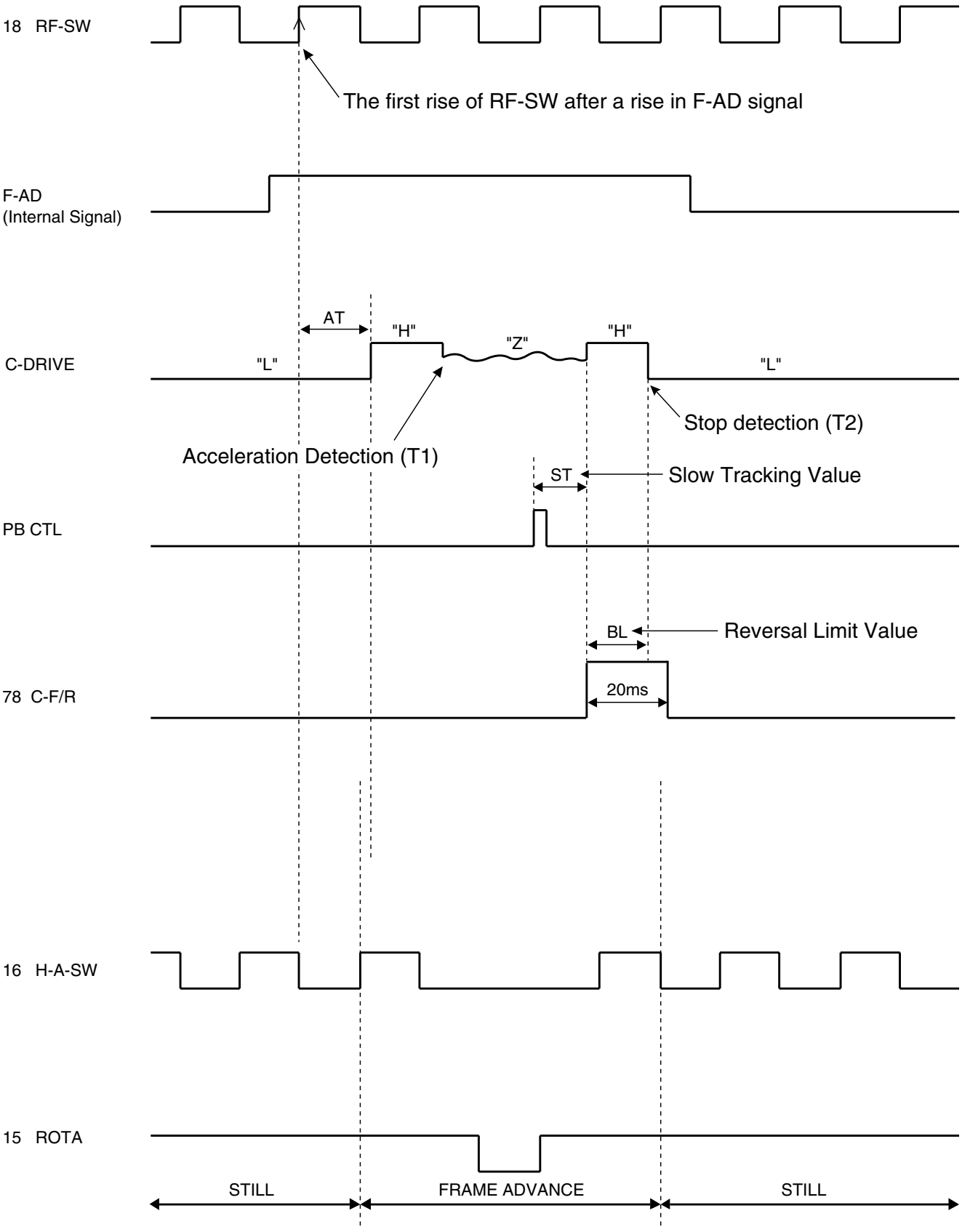



**Fig. 1**

**2) LP Mode**

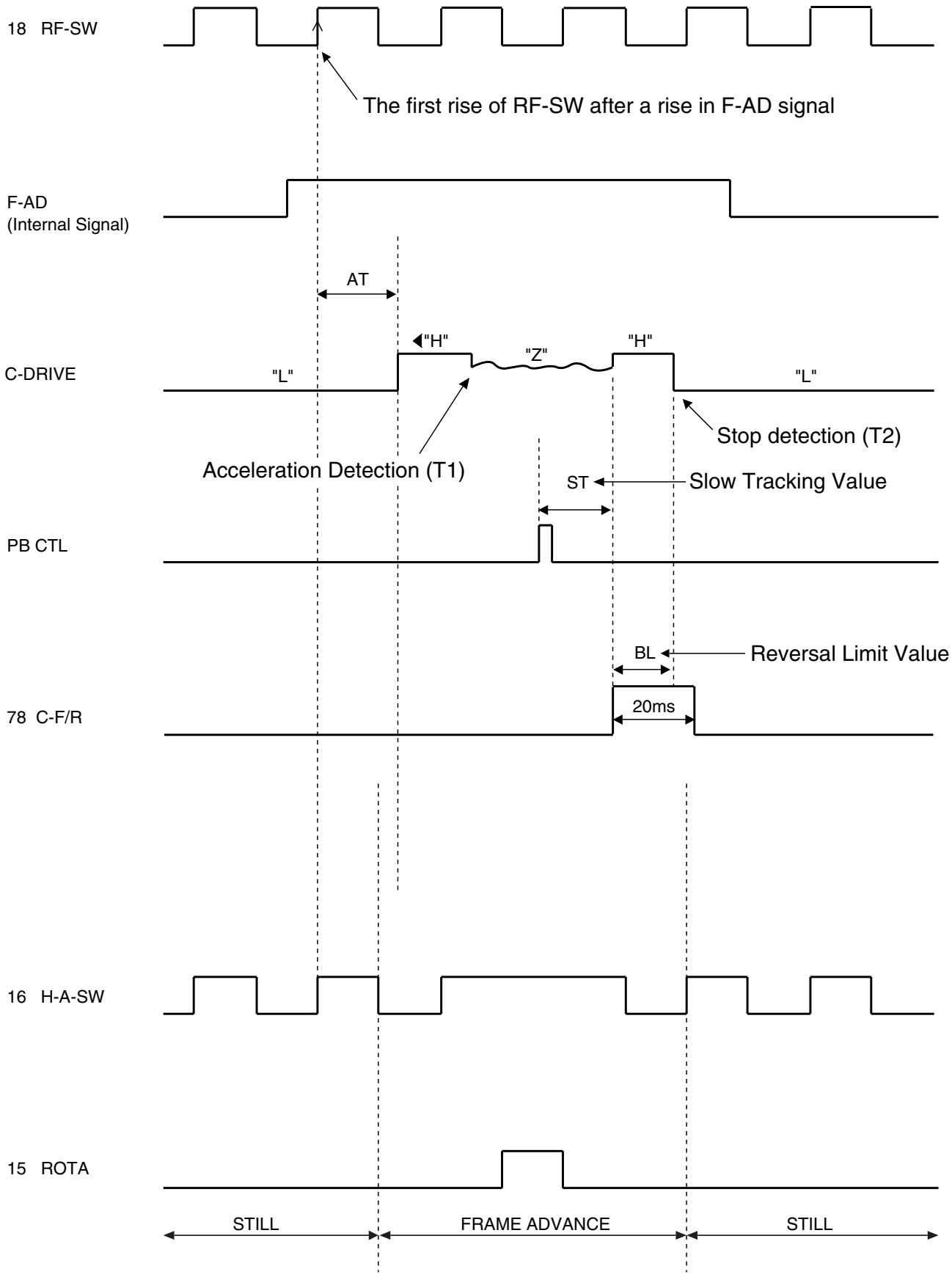



**Fig. 2**

**1. EJECT (POWER OFF) -> CASSETTE IN (POWER ON) -> STOP(B) -> STOP(A) -> PLAY -> RS -> FS -> PLAY -> STILL -> PLAY -> STOP(A)**

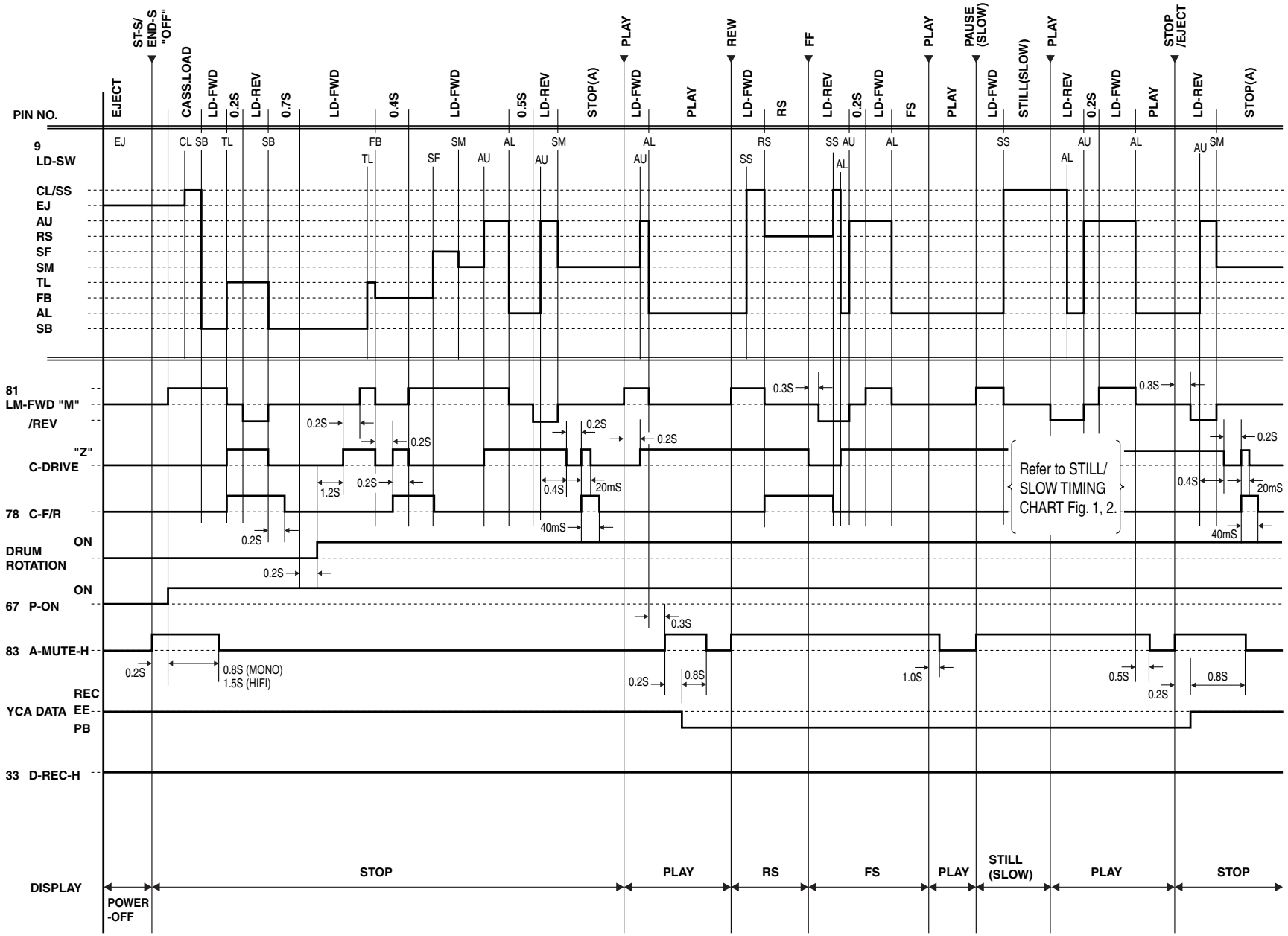



Fig. 3

**2. STOP(A) -> FF -> STOP(A) -> REW -> STOP(A) -> REC -> PAUSE -> PAUSE or REC -> STOP(A) -> EJECT**

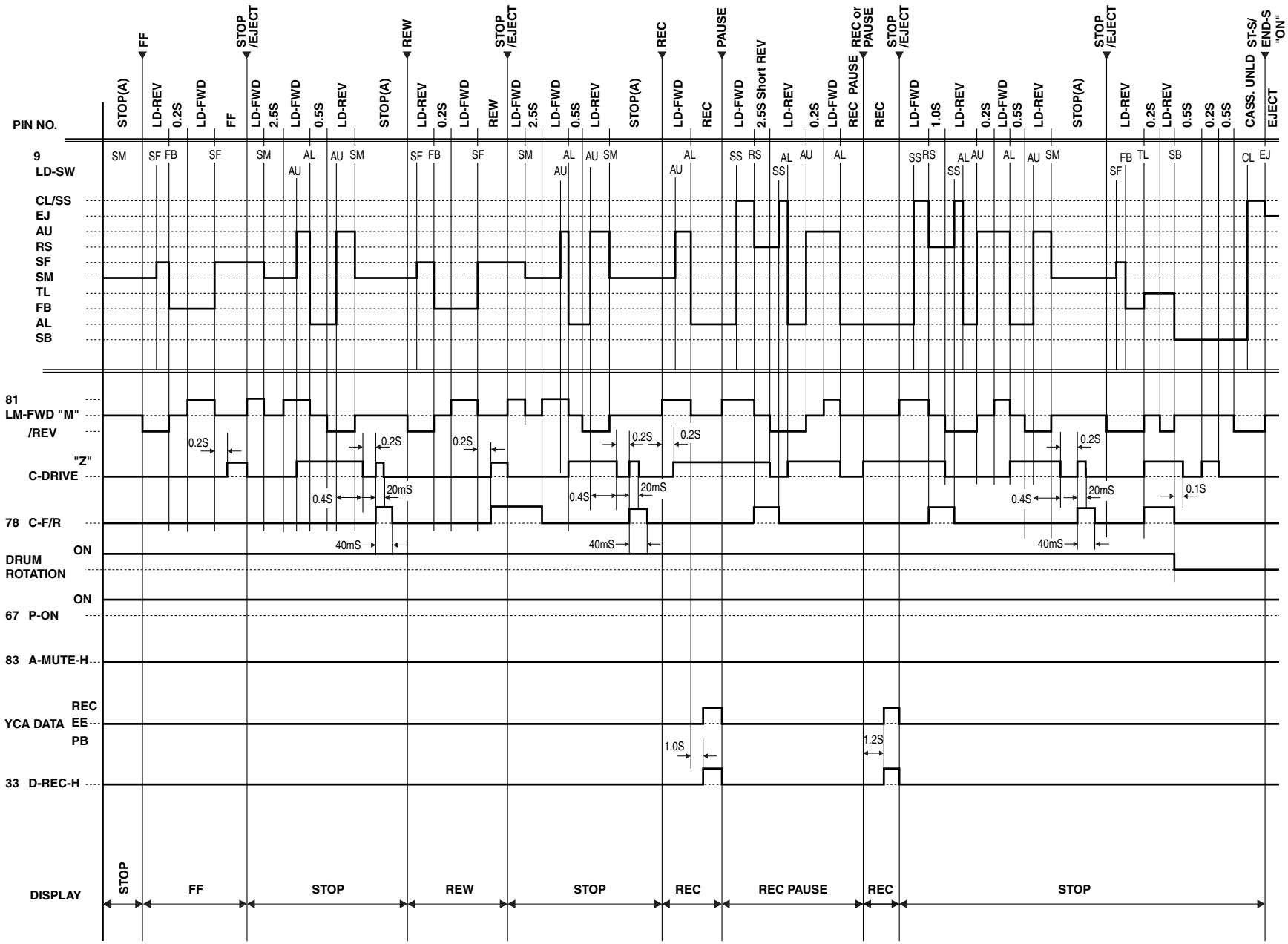
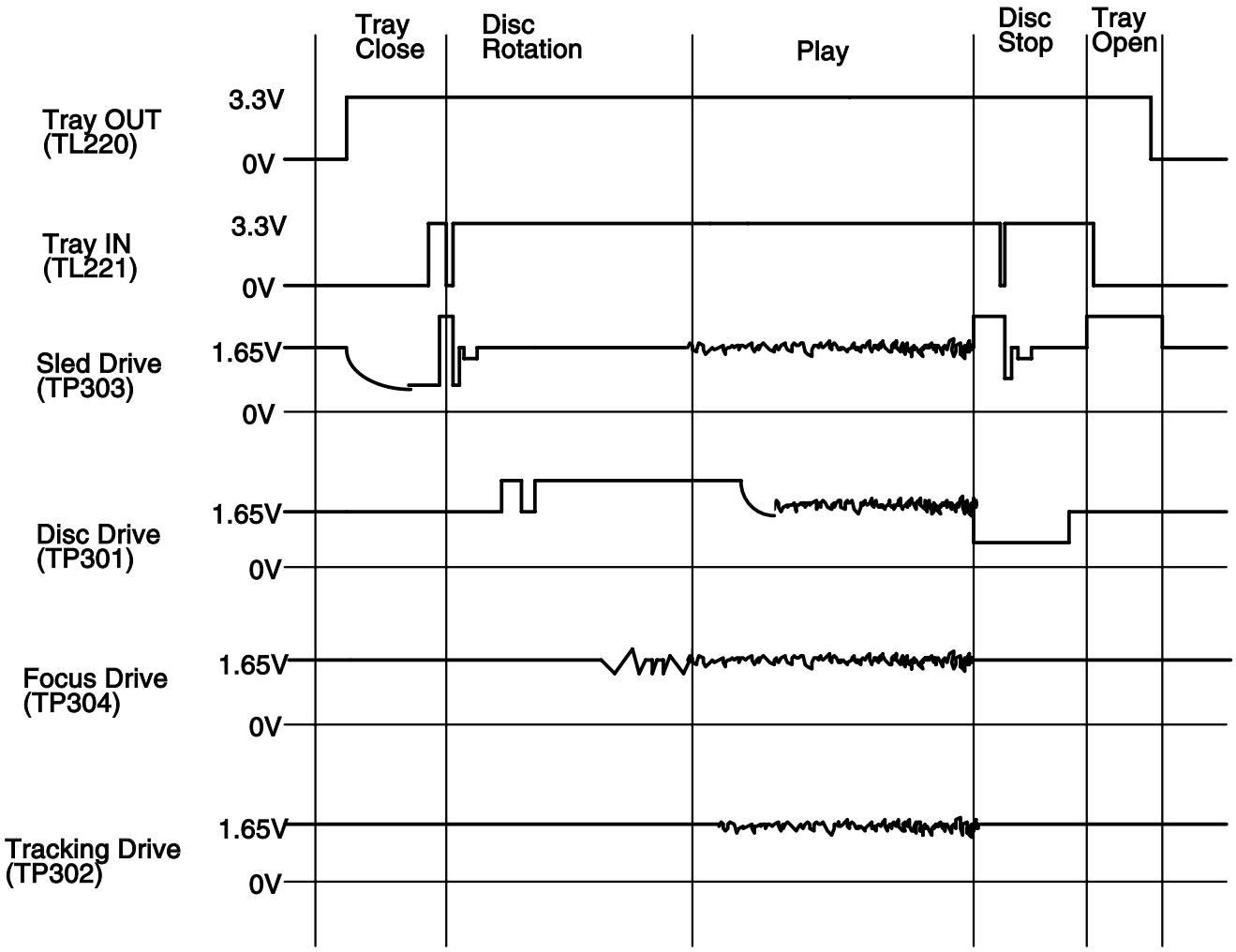



Fig. 4

## [ DVD Section ]

Tray Close ~ Play / Play ~ Tray Open



# 8 IC PIN FUNCTION DESCRIPTIONS

## [ VCR Section ]

### IC501( SERVO / SYSTEM CONTROL IC )

**"H" ≥ 4.5V, "L" ≤ 1.0V**

| Pin No. | IN/ OUT | Signal Name | Function | Active Level |
|---|---|---|---|---|
| 1 | IN | SC2-IN | Input Signal from Pin 8 of SCART2 | A/D |
| 2 | IN | PG-Delay | Video Head Switching Pulse Signal Adjusted Voltage | A/D |
| 3 | IN | POW-SAF | P-ON Power Detection Input Signal | A/D |
| 4 | IN | END-S | Tape End Position Detect Signal | A/D |
| 5 | IN | AFC | Automatic Frequency Control Signal | A/D |
| 6 | IN | V-ENV | Video Envelope Comparator Signal | A/D |
| 7 | IN | KEY-1 | Key Scan Input Signal 1 | A/D |
| 8 | IN | KEY-2 | Key Scan Input Signal 2 | A/D |
| 9 | IN | LD-SW | Deck Mode Position Detector Signal | A/D |
| 10 | IN | ST-S | Tape Start Position Detector Signal | A/D |
| 11 | - | NU | Not Used | - |
| 12 | - | NU | Not Used | - |
| 13 | OUT | D-V-SYNC | Dummy V-sync Output | H/Hi-z |
| 14 | IN | REMOTE -VIDEO | Remote Control Sensor | PULSE |
| 15 | OUT | C-ROTA | Color Phase Rotary Changeover Signal | H/L |
| 16 | OUT | H-A-SW | Video Head Amp Switching Pulse | H/L |
| 17 | IN | H-A-COMP | Head Amp Comparator Signal | H/L |
| 18 | OUT | RF-SW | Video Head Switching Pulse | H/L |
| 19 | OUT | Hi-Fi-H-SW | HiFi Audio Head Switching Pulse | H/L |
| 20 | IN | DAVN-L | VPS/PDC Data Receive = "L" | L |
| 21 | OUT | DVD-POWER | DVD Power Control Signal | H |
| 22 | - | NU | Not Used | - |
| 23 | OUT | POWER-LED | "POWER" LED Signal Output | H/L |
| 24 | - | NU | Not Used | - |
| 25 | OUT | TIMER-LED | "TIMER" LED Signal Output | H/L |
| 26 | OUT | REC-LED | "REC" LED Signal Output | H/L |
| 27 | - | NU | Not Used | - |
| 28 | - | NU | Not Used | - |
| 29 | OUT | DVD-LED | "DVD" LED Signal Output | H/L |
| 30 | OUT | VCR-LED | "VCR" LED Signal Output | H/L |
| 31 | IN | REC-SAF-SW | Recording Safety SW Detect (With Record tab="L"/ With out Record tab="H") | H/L |
| 32 | IN | A-MODE | Hi-Fi Tape Detection Signal | L |
| 33 | OUT | D-REC-H | Delayed Record Signal | L |
| 34 | IN | RESET | System Reset Signal (Reset="L") | L |
| 35 | IN | XCin | Sub Clock | - |
| 36 | OUT | XCOUT | Sub Clock | - |
| 37 | - | Vcc | Vcc | - |
| 38 | IN | Xin | Main Clock Input | - |
| 39 | OUT | Xout | Main Clock Input | - |
| 40 | - | Vss | Vss(GND) | - |
| 41 | - | NU | Not Used | - |
| 42 | IN | DVD-8PIN-IN | SCART 8Pin DVD Input Control Signal | H/L |
| 43 | IN | CLKSEL | Clock Select (GND) | L |
| 44 | IN | OSCin | Clock Input for letter size | - |
| 45 | OUT | OSCout | Clock Output for letter size | - |
| 46 | - | NU | Not Used | - |
| 47 | - | NU | Not Used | - |
| 48 | IN | FSC-IN [4.43MHz] | 4.43MHz Clock Input | - |
| 49 | - | OSDVss | OSDVss | - |
| 50 | IN | OSD-V-IN | OSD Video Signal Input | - |
| 51 | - | NU | Not Used | - |

| Pin No. | IN/ OUT | Signal Name | Function | Active Level |
|---|---|---|---|---|
| 52 | OUT | OSD-V-OUT | OSD Video Signal Output | - |
| 53 | - | OSDVcc | OSDVcc | - |
| 54 | - | NU | Not Used | - |
| 55 | - | NU | Not Used | - |
| 56 | - | NU | Not Used | - |
| 57 | - | NU | Not Used | - |
| 58 | IN | C-SYNC | Composite Synchronized Pulse | PULSE |
| 59 | OUT | 8POUT-1 | Control SCART 1 8Pin Level by using 8POUT-1 and 8POUT-2 | H/L |
| 60 | OUT | 8POUT-2 | Control SCART 1 8Pin Level by using 8POUT-1 and 8POUT-2 | H/L |
| 61 | - | NU | Not Used | - |
| 62 | - | NU | Not Used | - |
| 63 | - | NU | Not Used | - |
| 64 | - | NU | Not Used | - |
| 65 | - | NU | Not Used | - |
| 66 | OUT | C-POW-SW | Capstan Power Switching Signal | H/L |
| 67 | IN | P-ON-H | Power On Signal at High | H |
| 68 | OUT | DRV-DATA | LED Driver IC Control Data | H/L |
| 69 | OUT | DRV-STB | LED Driver IC Chip Select Signal | H/L |
| 70 | OUT | DRV-CLK | LED Driver IC Control Clock | H/L |
| 71 | OUT | IIC-BUS-SCL | IIC BUS Control Clock | H/L |
| 72 | IN/ OUT | IIC-BUS-SDA | IIC BUS Control Data | H/L |
| 73 | OUT | P-OFF-H | Power Off at High | L |
| 74 | OUT | OUTPUT-SELECT | Output Select | H/L |
| 75 | IN | DVD-POWER-MONITOR | DVD Power Monitor Signal (P-off="L", P-on="H") | H/L |
| 76 | OUT | C-CONT | Capstan Motor Control Signal | PWM |
| 77 | OUT | D-CONT | Drum Motor Control Signal | PWM |
| 78 | OUT | C-F/R | Capstan Motor FWD/ REV Control Signal (FWD="L"/REV="H") | H/L |
| 79 | IN | S-REEL | Supply Reel Rotation Signal | PULSE |
| 80 | IN | T-REEL | Take Up Reel Rotation Signal | PULSE |
| 81 | OUT | LM-FWD/ REV | Loading Motor Control Signal | H/L/ Hi-z |
| 82 | OUT | LINE-MUTE | Audio Mute Control Signal | L |
| 83 | OUT | A-MUTE-H | Audio Mute Control Signal (Mute = "H") | H |
| 84 | OUT | FF/REW-L | CTL Frequency Characteristics Switching Signal (FF/ REW="L") | L |
| 85 | - | NU | Not Used | - |
| 86 | IN | P-DOWN-L | Power Voltage Down Detector Signal | L |
| 87 | IN | C-FG | Capstan Motor Rotation Detection Pulse | PULSE |
| 88 | - | NU | Not Used | - |
| 89 | - | NU | Not Used | - |
| 90 | IN | D-PFG | Drum Motor Phase/ Frequency Generator | PULSE |
| 91 | - | AMPVREF OUT | V-Ref for CTL AMP | - |
| 92 | - | AMPVREF in | V-Ref for CTL AMP | - |
| 93 | - | NU | Not Used | - |
| 94 | IN/ OUT | CTL - | Playback/Record Control Signal (-) | H/L |
| 95 | IN/ OUT | CTL + | Playback/Record Control Signal (+) | H/L |
| 96 | - | AMPC | CTL AMP Connected Terminal | - |
| 97 | - | CTLAMP out | To Monitor for CTL AMP Output | PULSE |
| 98 | - | AMPVcc | AMPVcc | - |
| 99 | - | AVcc | A/D Converter Power Input/ Standard Voltage Input | - |
| 100 | IN | AGC | IF AGC Control Signal | A/D |

**Notes:**

Abbreviation for Active Level:

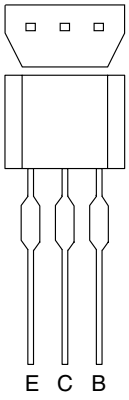
PWM -----Pulse Wide Modulation

A/D--------Analog - Digital Converter

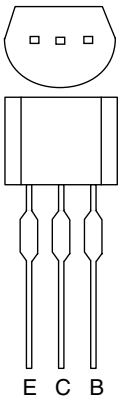
## IC612 [ PT6315-S(TP) ]

| Pin No. | In/Out | Signal Name | Name Function |
|---|---|---|---|
| 1 | In | CLK | Clock Input |
| 2 | In | STB | Serial Interface Strobe |
| 3 | In | K1 | Key Data 1 Input |
| 4 | In | K2 | Key Data 2 Input |
| 5 | - | VSS | GND |
| 6 | - | VDD | Power Supply |
| 7 | Out | a | Segment Output |
| 8 | | b | |
| 9 | | c | |
| 10 | | d | |
| 11 | | e | |
| 12 | | f | |
| 13 | | g | |
| 14 | | h | |
| 15 | - | VEE | Pull Down Level |
| 16 | Out | i | Segment Output |
| 17 | Out | 7G | Grid Output |
| 18 | | 6G | |
| 19 | | 5G | |
| 20 | | 4G | |
| 21 | | 3G | |
| 22 | | 2G | |
| 23 | | 1G | |
| 24 | - | VDD | Power Supply |
| 25 | - | VSS | GND |
| 26 | In | OSC | Oscillator Input |
| 27 | Out | DOUT | Serial Data Output |
| 28 | In | DIN | Serial Data Input |

# 9 LEAD IDENTIFICATIONS

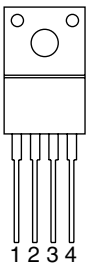



BN1L4M-T
BN1F4M-T
BA1F4M-T
KTA1266(GR)
KTC3199(Y,GR,BL)
2SC2785(J,H,F,K)
KRC103M
KRA103M
2SA1175(J,H,F)
KTA1267(Y)
KTA1267(GR)
KRA104M

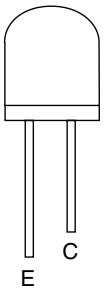



2SC1815-BL(TPE2)
2SC1815-Y(TPE2)
2SC1815-GR(TPE2)
2SC2120-Y(TPE2)
KTC3203(Y)
2SA1015-GR(TPE2)
2SA1020(Y)
2SC3266-Y(TPE2)
KTA1281(Y)
KTC3205(Y)

PQ070XF01SZ




MID-32A22
PT204-6B-12

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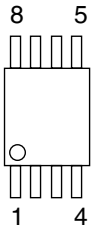
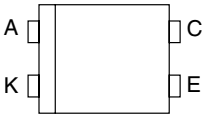
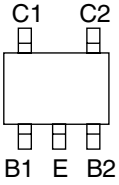
KIA4558P




LTV-817(B,C)-F
EL817(A,B,C)




FMG4A T148
RN1511(TE85R)




FA1F4M-T1B
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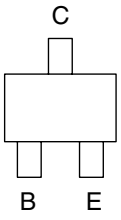
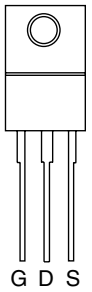
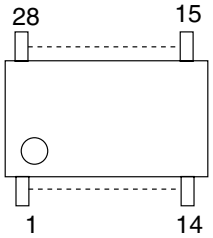
KTC3875Y-RTK



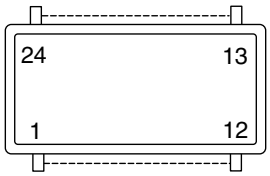

2SK3566



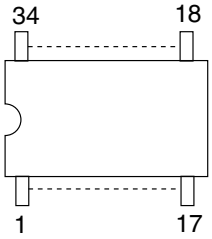

PT6313-S-TP



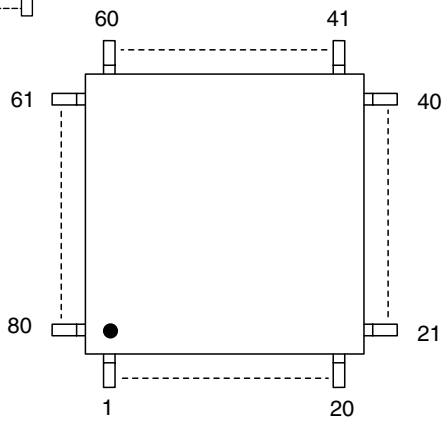

LC74793JM-TRM




MM1567AJBE




LA72648M

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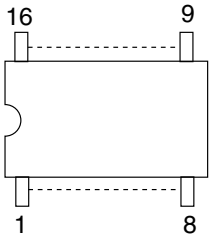
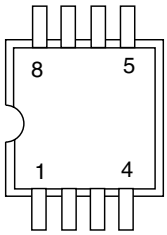
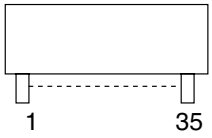
BU4053BCF-E2



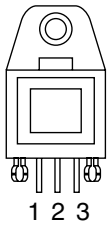

CAT24WC02JI
BR24C02F-W




7-BT-292GN




0C-0805T*002
GP1FA512TZV

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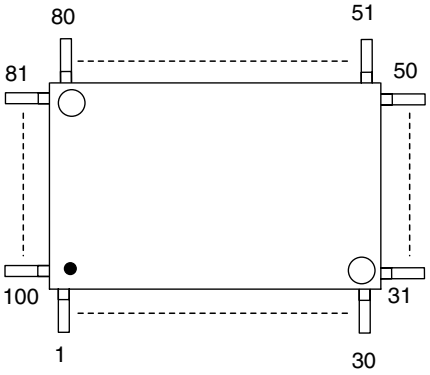
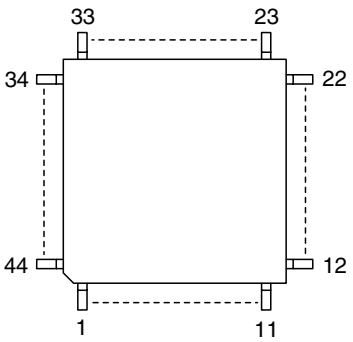



MSP3417G-QG-B8
MSP3417G-QG-B8-V3




**Note:**
A: Anode
K: Cathode
E: Emitter
C: Collector
B: Base
R: Reference
S: Source
G: Gate
D: Drain

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